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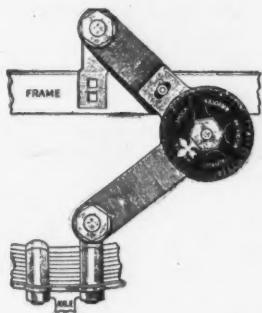
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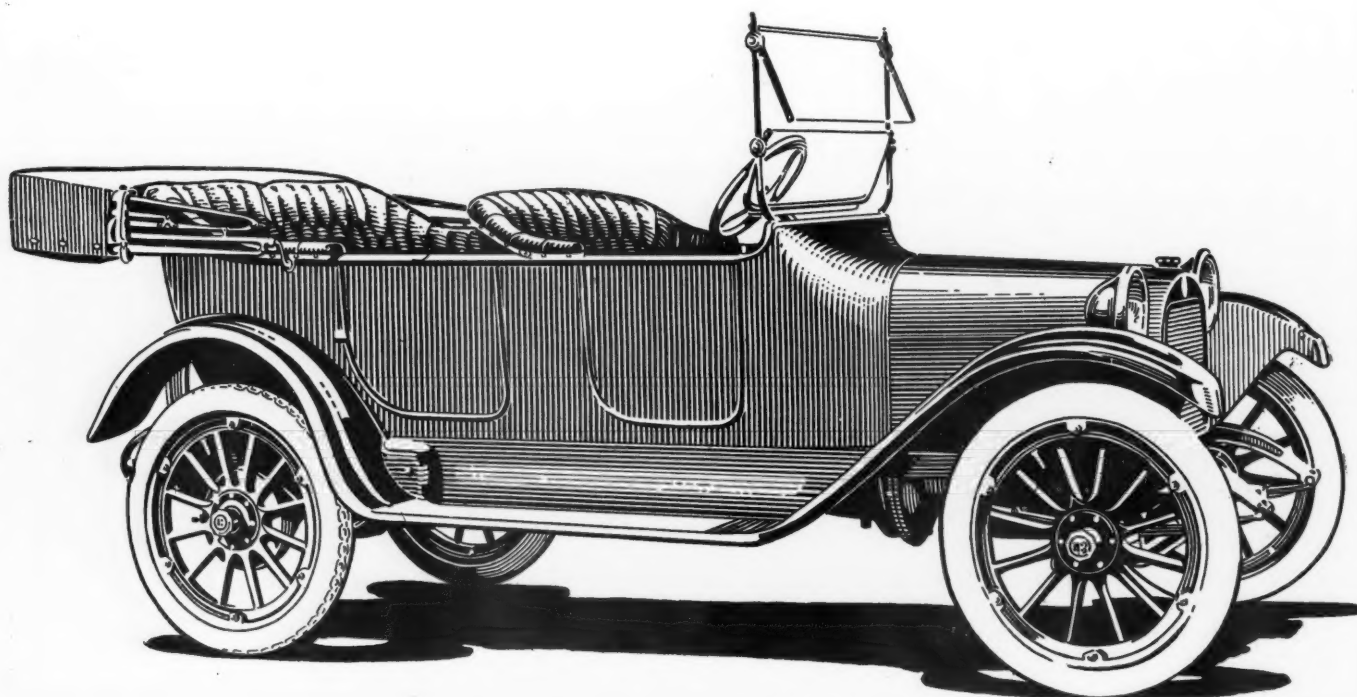
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Volume XXVI

November 26, 1914

No. 22

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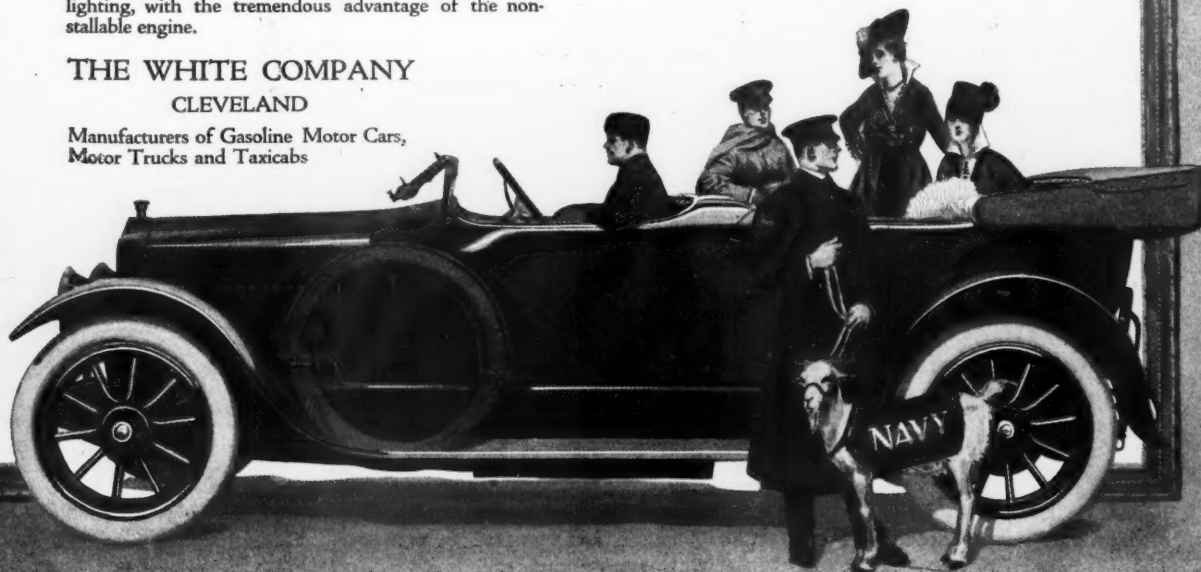
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MOTOR AGE

Motoring to the Hiss and Screech of German Shells

Editor's Note—W. F. Bradley, European representative of Motor Age, who spent several weeks in the British service, driving a motor car from headquarters to the firing line, herewith describes his experiences as a civilian, armed with passes that gave him open sesame to the most interesting parts of Belgium. Naturally he describes military motoring as he saw it on his expedition and his critical review of the situation should be of interest to Motor Age readers.

By W. F. Bradley

ON THE BELGIAN FRONTIER, Nov. 5

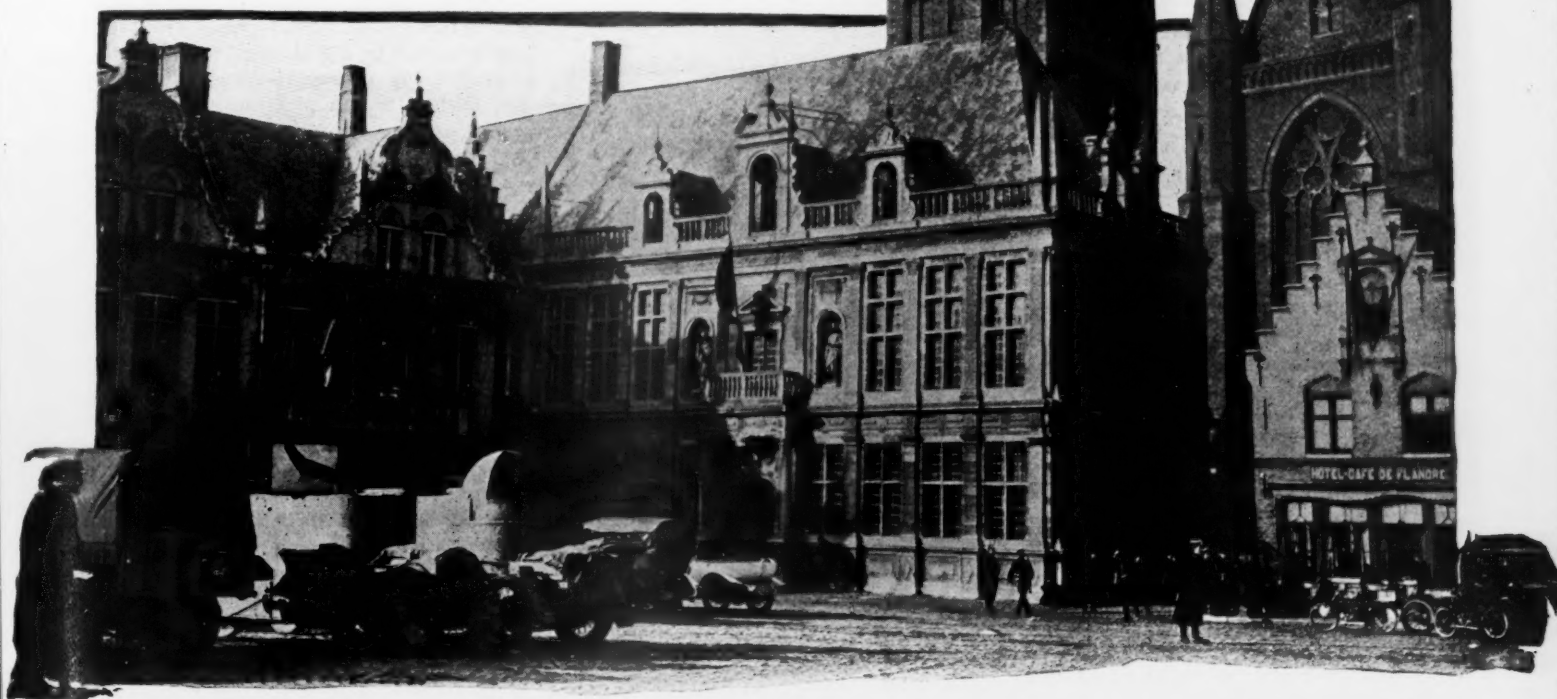
—Over deserted highways we sped through Normandy, charmingly beautiful in its autumnal cloak. Motor cars are too useful to be given to expend their energies haphazard; they are too dangerous to be allowed full liberty. The military authorities have sought to abolish all private motor traffic, and as ours was a civilian mission we had first of all to be put through the double sieve of a military and civil interrogation.

When the police inspector ushered us out of his private office, the little he did not

know about us was hardly worth knowing. But this was not sufficient to give us the freedom of the road. Two hours later we had to appear, hat in hand, before a military board of five officers who questioned us and cross-questioned us as if anxious to worm out some of the hidden secrets of our lives. Then were we free to travel over some of the deserted highways of

France, roads rutted by war.

Motors are not the only restricted means of locomotion. When the train service is needed by the army the public has to wait—or walk. Thus, in a certain quiet township a farmer begged a lift to his home, 20 miles away. When we had been assured that there were no military posts on this portion of the road, he was taken aboard. He got



HISTORIC PUBLIC SQUARE AT FURNES, THE PHOTOGRAPH OF WHICH WAS TAKEN WHILE THE GERMANS WERE SHELLING THE CITY. NOTE THE ARMORED MOTOR CARS



MOTOR AGE CORRESPONDENT CHATTING WITH FRENCH AND BELGIAN SOLDIERS ON THE ROAD OUTSIDE FURNES

out on the outskirts of the town, so as to avoid passing before the guards, for however honorable he might be, it was forbidden for him to ride in a car without a special military permit. In half an hour he had covered a distance which would have necessitated 6 or 7 hours steady tramping. At a grade crossing we came upon the cause of the suppression of his ordinary means of travel: a troop train, drawn by two powerful American engines, and carrying English horses and men to be flung into the great battle line on the northeast frontier.

At nightfall shelter was sought in a second-rate hotel of a small French town. The law forbade us as civilians to travel after sundown. The occupants of three military cars dined, lit their lamps and went forth into the darkness while we climbed a narrow staircase to an old-fashioned bedroom. Poets sing of the glory of war; travelers along the highroads see little but its misery.

Pitiful Tales of the Refugees

Climbing a hill into a big village square, we came upon hundreds of refugees and scores of long, lumbering farm wagons filled with household goods, old men and women and children. They were Belgian peasants who had fled from their quiet farms and peaceful villages as the German hordes swept in. There were few valid men among them, for the army had claimed them. They told pitiful tales of their houses razed before their eyes, their cattle driven away, members of their community driven off as hostages, of long marching, of nights spent in barns or sleeping in their wagons by the roadside. French gendarmes had taken in hand these human derelicts and were passing them on, from town to town, to districts where they could find employment and the necessities of life.

By devious routes, so as to avoid the main roads which might have been con-

gested with army convoys, we worked our way towards that northeast corner of France where British, French and Belgian were endeavoring to drive back the innumerable forces of Germany. A village street was filled with women wending their way to church; all were in deep mourning and there was not a man among them. There were more villages, deserted by all but women and children; valleys and hillsides were as quiet as the grave. Of military preparations there was not a sign.

Stopped Continually by Pickets

Suddenly, from a thicket by the roadside, a soldier stepped forth, raising his rifle with a meaning that could not be mistaken. We had entered the area occupied by the French and Belgian armies. The pass was examined carefully, the photographs it bore being compared with our features before we were allowed to pass into the war area. At various intervals, which might



W. F. BRADLEY, MOTOR AGE REPRESENTATIVE, DRIVING A BELGIAN OFFICER NEAR THE FIRING LINE AROUND DIXMUDE

be from 1½ to 3 miles, the same operation was gone through. French soldiers gave way to Belgian guards, then to Frenchmen, then again to Belgians. We were in the level dyke country, cut up with canals along which clumsy barges were towed by men and sometimes by mere girls. The roads were crowded with Belgian soldiers—the remnants of a gallant army which had been sent to the rear to reform for more desperate resistance.

We had plenty of opportunities of judging the temper of the three nations united in their stand against the forces of the Fatherland. The English were authoritative, their officers haughty; the French were suspicious, their officers studiously correct; the Belgians were kindly, their officers hearty. At one of the posts Belgian soldiers barred our path. The sergeant in command frankly stated that he was not satisfied as to our right to be in the military area; but he put his objections in such a gentlemanly manner, he was so courteous, that it was a pleasure rather than otherwise to be questioned by him.

Giving a Lift to the Wounded

A few miles further on, at a turn of the road where our direction seemed doubtful, we came upon a group of four Belgian soldiers and two gendarmes. Two of the men being sick, we offered them a seat in the car, and at the same time took over the rifles and kit of the others, promising to deposit all at the next village. After 10 days in the trenches, without being able to lie down to sleep, never a wash, food passed on to them at night, our two passengers looked more like scarecrows than soldiers. They were both volunteers, mere youths, whose homes had been wrecked, whose parents had been scattered, and who were fighting with the desperation of men who had nothing more to lose and everything to gain.

Travelers, whether on foot, drawn by horses or propelled by gasoline, could not

get into the important frontier town of A—— until they had been individually examined. To get out again was even more difficult and probably we should have been there still had it not been for the kindly intervention of the Belgian authorities who gave all necessary passes to travel through the small portion of their territory still withheld from the enemy.

Wreaths for the Unknown Dead

It was a Sunday afternoon. On the immediate outskirts of the fortified town well-dressed burghers were making a pious pilgrimage to the cemetery and were depositing wreaths in memory of many who lay in unknown graves. To the northeast the steady boom of the cannon could be heard. On the main road running by the side of the canal there was such a variegated collection of human beings, of animals, of vehicles, of material, as only war can produce. It had once been a well-kept highway. But war material had rumbled along it, thousands of hoofs had loosened its surface, thousands of feet had trampled it into a bed of mud. Along the center the going was fairly good, but this passage was barely sufficient for two cars, and on each side were mud ruts with holes from a few inches to a few feet deep.

The procession of military motor cars was unending. As they passed one another they skidded and swerved in the mud baths, rocked ominously, but kept on their course. The war found Belgium without any great number of motor trucks, but with a good stock of touring cars. These machines have been taken and put to the most widely different tasks. Handsome limousines built by Van den Plas and D'Iteren carried staff officers, equally handsome cars were filled with raw meat, packed to the roof with bread loaves, carried fodder for the horses, saddles, ammunition, oil and gasoline—everything which can be useful to man or beast in war. Take the motor cars on Fifth avenue, New York, when traffic is most intense, leave a few of the best cars untouched, set a band of ruffians to work on the others, bespattering them with mud, breaking the lamps, smash-



A WRECKED GERMAN TRUCK IN WHICH SOLDIERS HAD BEEN MOVED FORWARD ON THE ROAD FROM NIEUPORT TO FURNES

ing the mudguards, tearing the hood, delving the panels, smearing the upholstery, and you will have some idea of the state of the cars used in the Belgian army.

American Cars Aid Belgians

Evidently the Belgian supply of cars has not been sufficient for the army's needs, for dozens of Overlands were noted in the convoys, occasionally a Maxwell was seen and staff officers occupied a Packard. It is obvious that touring cars are not the best vehicles for the various services to which they were put, but it was remarkable to note with what success the cars built for passenger-carrying work were doing duties as varied as carrying King Albert and transporting barbed wire to the front.

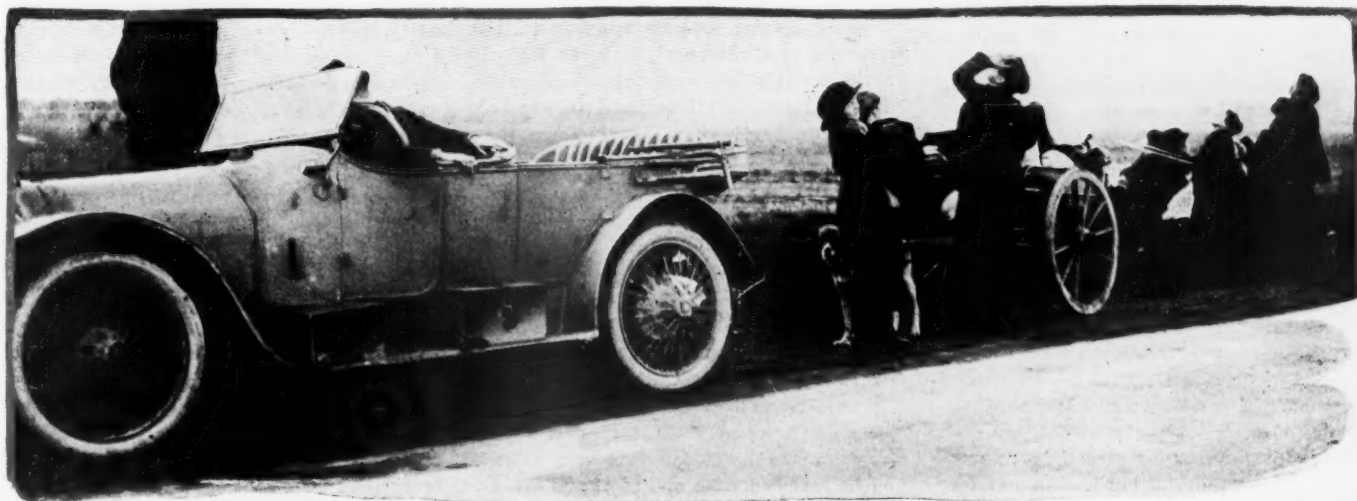
England, France and Germany have special types of cars for special kinds of work, each machine being the result of careful thought and study. Belgium, plunged into a defensive war with no warning and little preparation, has had to rely on its touring cars—and has reason to be proud of

them. King Albert's army has lost most of its cavalry, it has few transport horses, but it is feeding itself and moving itself in a wonderful manner by means of touring cars.

Made Touring Cars Bulletproof

There is another use to which the Belgians have put their more powerful touring car chassis. Minervas, Savas, Excelsiors and Pipes, in particular, have been fitted with machine guns and armor plating, and have done excellent service in the recent operations. There is nothing at all special about the chassis, and even the armor plating is not a difficult matter. Steel plates of not less than 5 millimeters thickness are built around the chassis, forming a single compartment in the center of which the gun is pivoted. In some cases a revolving turret is fitted, while others merely have a shield in front of the gun and of course revolving with it. The driver occupies the most central position in the machine and is practically immune from attack except on the complete destruction of the vehicle. He has a view straight ahead through a hinged shutter and in addition has a small port on the right, level with his head.

Germans were bombarding the town of Furnes when we ran onto the beautiful and historic marketplace. It was a curious situation: the weather was ideal; the big square was filled with armored cars, touring cars, and light trucks; French and Belgian soldiers marched through from time to time; officers came and went in cars; American and English newspapermen, driven out by the French and the English, found shelter in this Belgian town and marched up and down with camera in hand; refugees with their scanty belongings on bicycles, on wheelbarrows, on frail carts drawn by a dog or a donkey, hastened away westward; idlers stood at the street corners—and suddenly a shell burst over the town, coming from nobody knew where. The aim was indifferent for a couple of hours; then the Germans seemed to get the range, for a shell fell on the roof of one of the houses, within 20 yards of



A MOTORIST AND BELGIAN REFUGEES WATCHING A GERMAN AEROPLANE ON THE ROAD FROM FURNES TO NIEUPORT



A SAVA ARMORED CAR PHOTOGRAPHED DURING THE BATTLE OF THE YSER

where King Albert was standing. At the top of the tower, built in 1623, and which was being used by the Germans as a target, observers finally got the location of the battery. A force was sent out and within a couple of hours the guns had been silenced and sixty German prisoners were being marched across the square escorted by Algerian cavalry. The guns had been hidden in a farm when the enemy was forced to retreat and a small force had moved forward to operate them until ammunition was exhausted. The soldiers were captured and the civilians, who had allowed the farm to be used, were shot.

Road Choked With War Traffic

As evening closed in we ran back to French territory over a road blocked with every kind of traffic. Belgian artillery was being sent to the rear, and hundreds of refugees were taking advantage of the gun carriages to set their various bundles on them and walk by their side. Every class of society was represented, from the peasant in rough sabots carrying some clothing tied in a dirty bed sheet, to the comfortable bourgeoisie in furs and jewelry. There was no whining or complaining. A man with a big black trunk on a wheelbarrow, his wife bending under a heavy bundle, and each of his four children carrying some domestic article, stopped to relate to a group of soldiers how he had decided to move when a shot had gone right through his house.

French long range artillery moved forward at a brisk trot, accompanied by their ammunition wagons surmounted by jet-black African soldiers who looked cleaner than most of the Europeans and certainly displayed more boyish glee. A wrecked German touring car lay directly across the bank with its radiator but a couple of feet from the canal. It had attempted the previous evening to get through to French



REAR VIEW OF SAVA ARMORED CAR

territory. One of the new French four-wheel-drive tractors had taken fire and was being stripped by the mechanics of all the parts which might serve for companion machines. Cattle were being driven rearwards by Belgian soldiers who advised the motorists to "charge right in at them." In the country left and right of the road barbed wire obstructions had been erected, there were deep trenches behind, then further to the rear more trenches, completely covered over and forming human "warrens."

A Kingdom for Gasoline

Sleeping is always a delicate problem at the front. After some difficulty we discovered an attic with two beds in it, a window about a foot square and a roof so low that we could hardly stand upright. The furniture consisted of a broken chair and a dirty comb. As we examined it dubiously the landlady remarked "Can't you be satisfied with one of the beds?"

During the night an order was posted in that town that all motor cars, of what-

ever kind and without a single exception, must be presented to the gendarmes within 24 hours, under pain of confiscation. We decided to flee from that town. But there was no gasoline to be obtained. Without any warning the military authorities had confiscated the entire stock. After a thorough search we were able to pick up a gallon which a garage proprietor declared he had "found" in a touring car, and to discover a gallon of benzol at a grocery store.

Royalty Passes in Review

Just after crossing the frontier station into Belgium there was an imperative shriek from an electric horn and a dozen handsome cars came round a bend of the road at a fast clip, driving all other users into the muddy side tracks. The cars carried King Albert of Belgium, President Poincaré, the French and Belgian ministers of war, Lord Kitchener and staff officers of the various armies.

Shells had ceased falling at Furnes, but were coming down 5 miles to the east. Even this was

sufficient to bring many of the peasants back again to their fields and their houses. It was reported that the road was cut up by shells, so we left the car in the village apple market and moved ahead on foot following the coast road, the possession of which was still disputed. Wreckage was plentiful. By the side of a cobble-paved road lay a German motor truck which had been used for bringing infantry forward. In one of the partly flooded fields was a German caterpillar tractor used for hauling guns across country. It was of the same type as some of the machines used by the French farmers for plowing. The Belgians had opened their dykes and even the caterpillar had become embedded in the mud.

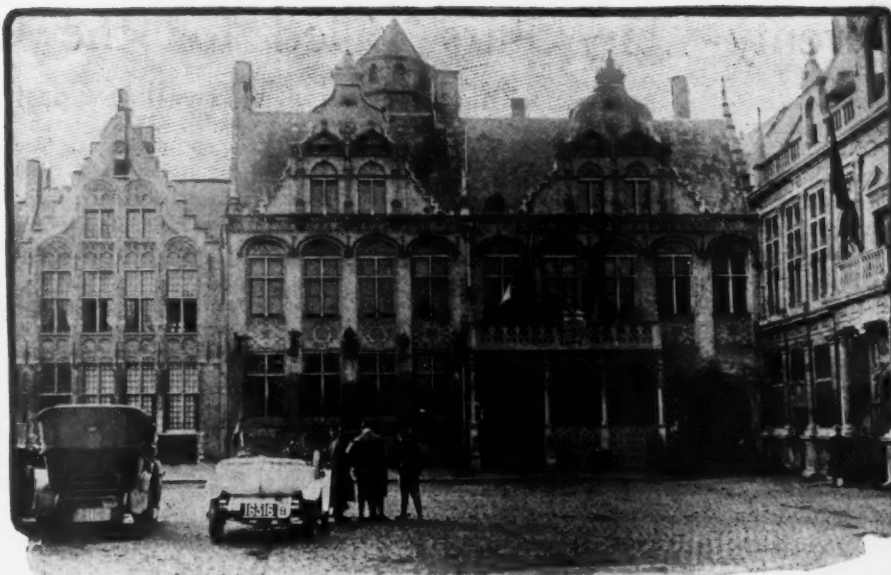
The hiss and clap of shells greeted us at frequent intervals, but such is modern war that there was nothing to indicate where they were coming from or what they were being fired at. When the branches of trees began to fall 30 yards away, we thought it best to retire. While we were doing so some of the famous French heavy artillery came up, drawn by their four-wheel-drive gasoline tractors only introduced about a year ago. A couple of miles further back a score of Paris motor buses rambled past, each one carrying forty men.

Running past one of the French encampments near the Franco-Belgian frontier, we had an example of the extreme mobility made possible by the use of motor cars. A driver hailed us and proved to be a friend in the motor car business. Two days before he had been at the other end of the battle line, 200 miles away. Reinforcements were required at the north end and within an hour hundreds of cars and trucks had been sent out with officers, men, guns and ammunition.

The gasoline problem was becoming

acute when luck intervened. A Belgian officer approached the group of which we formed a part and asked if any car was going back into French territory. We seized the opportunity, volunteering not only to carry him into France but to his final destination, about 50 miles away. With a military order the gasoline was forthcoming immediately, and in much less than 2 hours we had brought the captain a distance which it would have required 10 or 12 hours to cover by train. It takes little to disorganize a railroad, while it is practically impossible to disorganize a motor car service.

That run gave us an opportunity to examine some of the London motor buses in war paint. Every word of advertising matter had been removed, they had been painted a dull grey, the windows had been replaced by boarding, and the only decoration was a bouquet of flowers hung up by some Tommy where the service number usually appeared.



MOTOR CARS STANDING OUTSIDE HEADQUARTERS OF KING ALBERT OF BELGIUM

Uncle Sam Checks Up on the Latin-American Outlook

Reports Show Situation to be Greatly Complicated

WASHINGTON, D. C., Nov. 21—Officials of the bureau of domestic and foreign commerce are making efforts to find ways and means for diverting to the United States the Latin-American trade which went to European countries before the outbreak of the war. The officials are now engaged in going over numerous reports on conditions received from agents of the bureau in Latin America.

Preliminary reports received by the bureau recently show the situation to be greatly complicated. With the exception of Argentina, every country is financially embarrassed to a greater or less extent. With some of them, notably Brazil, financial conditions before the European war began have served to add to the difficulties. With others the situation is the same as that which faced the cotton growers of this country when their European market was closed by the war. They are loaded

with huge crops and mineral products usually absorbed by European manufacturers, now out of reach.

It is pointed out there are very few factories in South America and little prospect of those of the United States being able to take up any large portion of the raw materials now filling warehouses in South American cities. Without exception the American consuls report that some arrangement must be made to provide financial aid and permit South American producers to realize to some extent on these stored products as a preliminary to the permanent establishment of the United States in South American trade.

It has been suggested that a loan syndicate similar to that created for the American cotton producers based on 50 per cent of their market value would be taken as security. The generally disturbed financial conditions of the countries involved, how-

ever, make this hard to accomplish while American investors can secure 6 per cent bonds issued by such sound institutions as the municipality of New York.

While officials of the department of commerce admit it seems unlikely anything can be accomplished toward diverting the South American trade to the United States for several months at least, they are not hopeless that a way will be found.

At the chamber of commerce of the United States the view of the South American trade situation expressed by Elliott H. Goodwin, general secretary, was somewhat different. Mr. Goodwin said the national chamber would take up with the federal trade commission, immediately upon its appointment by President Woodrow Wilson, the urgent necessity of amendment to the anti-trust laws to permit American manufacturers to cooperate in handling their foreign trade.



ON THE LEFT—BELGIAN SOLDIERS BRINGING THEIR DINNER HOME. SCENE NEAR NIEUPORT. ON THE RIGHT—MOTOR CAR AND BELGIAN REFUGEES ON THE MAIN ROAD TO DUNKIRK

Twenty-One Stars Billed for the Corona Road Race

Oldfield to Drive Maxwell in Coast Event

CORONA, Cal., Nov. 21—It was officially announced here today that Barney Oldfield would drive in the Corona road race Thanksgiving Day. Oldfield's mount is to be one of the fast Maxwell entries.

Oldfield held out for appearance money and refused to appear although Walter M. Brown had entered the Stutz which the veteran drove at Indianapolis and in the Los Angeles-Phoenix road race. The Corona Racing Association would not meet Oldfield's demands and it was believed that he would not appear on the course November 26, but the Maxwell company offered a large amount for Oldfield's services and late last night he agreed to pilot one of the Maxwells in the 300-mile Corona race.

Practice for the Thanksgiving Day event commenced November 17 and each morning there has been a large gathering on the course watching the fast men work out. The foreign cars are attracting a great deal of attention. The Peugeots are practically unknown to Pacific coast race followers and the Sunbeams are attractions on account of the accident on the Wilshire avenue turn in the Santa Monica races last spring. In practice yesterday Burman turned a lap at the rate of 103 miles an hour and today Pullen in a Mercer did a lap—2.76 miles—at 100 miles per hour.

Harry Babcock is driving the car which almost killed Johnny Marquis at Santa Monica, but the car has been rebuilt and does not look like the same machine. Instead of aluminum, the Sunbeam bodies are now of steel and they are lighter than the old aluminum plates. This is on account of the thin material which may be used in the steel construction. The English speed-creations were top heavy, it is claimed, but now the Sunbeams have been lowered until they hug the course.

The car which Grant is to drive at Corona is equipped with two 25-gallon gasoline tanks which are carried beneath the car, leaving a clearance of barely 6 inches. While the tanks feed together, they are entirely separate and if Grant should spring a leak in one tank he will be able to cut off the defective tank and use the other. A low-hung 10-gallon oil tank is carried on the rear of Grant's Sunbeam. With this equipment it is claimed that Grant will be able to finish the 300-mile race without a stop.

The Maxwells have been improved. Billy Carlson, one of the Maxwell drivers, is responsible for the statement that the two cars are 15 miles an hour faster than they were at Indianapolis last May.

The Corona classic promises to be the greatest race ever held on a southern California course. Even the Vanderbilt and grand prix races at Santa Monica last February failed to bring out the classy

entry list that is lined up for Corona. The fact that Corona is giving a \$12,000 purse, the largest amount ever given for a California speed event, has made the race one of the greatest of the 1914 racing season.

The name of the driver of the third Stutz is given out as Dave Lewis. It is rumored that Tetzlaff would be at the wheel of Oldfield's car when the race started and others claimed that Frank Verbeck, winner of the Panama-Pacific race, would be the third Stutz driver, but both of the guesses were wrong.

Much interest is centered around the Mercer trio. Eddie Pullen is a favorite here on the coast and has a large following among the eastern tourists. Louis Nikrent and Guy Ruckstall are local men and have yet to make good in fast company.

Nikrent's latest achievement was the winning of second place in the Phoenix classic at the wheel of a Paige car; but he has been connected with the racing sport in California for many years. As the winner of the second annual Los Angeles-Phoenix race in a Buick, Nikrent first became known as a racing driver. He drove a Buick in every Phoenix race up to this year and finished in the money every time with the exception of once. In 1912, Nikrent's Buick was wrecked a few miles out of Los Angeles. The new member of the Mercer team holds many intercity records and light car records on the Los Angeles motordrome.

Guy Ruckstall came out first in the Panama-Pacific race and has since been competing for the Mercer organization in all the races held on the coast. The complete entry list as announced November 19 is as follows:

Car and driver	Entrant
Peugeot, Bob Burman.....	Peugeot Import Co.
Peugeot, Ed Rickenbacher.....	Peugeot Import Co.
Sunbeam, Harry Grant.....	Harry Grant
Sunbeam, Harry Babcock.....	Harry Grant
Duesenberg, Tom Alley.....	F. Duesenberg
Duesenberg, Eddie O'Donnell.....	F. Duesenberg
Duesenberg, J. Callaghan.....	F. L. Duesenberg
Stutz, Earl Cooper.....	Earl Cooper
Stutz, Arthur Klein.....	Walter M. Brown
Stutz, Dave Lewis.....	Walter M. Brown
Mercer, Eddie Pullen.....	Simplex-Mercer Co.
Mercer, Louis Nikrent.....	Simplex-Mercer Co.
Mercer, Guy Ruckstall.....	Simplex-Mercer Co.
Marmon, Wilbur D'Alene.....	Wilbur D'Alene
Marmon, A. A. Cadwell.....	A. A. Cadwell
Maxwell, Barney Oldfield.....	Maxwell Motor Co., Inc.
Maxwell, Billy Carlson.....	Maxwell Motor Co., Inc.
Mercedes, Ralph de Palma.....	Ralph de Palma
King, Guy Ball.....	Eagle Motor Co.
Gordon Special, Huntly Gordon.....	Tom Gordon
Bergdoll Special, Erwin Bergdoll.....	Erwin Bergdoll

Cash prize \$12,000, and \$5,000 Flagler trophy.
Length of Corona course, 2.76 miles; length of Corona race, 301.81 miles, or 109 laps of course.

SAN DIEGO TO HAVE RACE

Los Angeles, Cal., Nov. 18—A road race has been projected for San Diego which may take on the color of one of the big speed events of the 1914 season. The date as named by the boosters for the Exposition City event is January 9 and it is be-

lieved that the speed kings entered at Corona will remain in Southern California for the San Diego event and then go north for the Vanderbilt and grand prix races which are to be held on the exposition course, February 22 and 27. The San Diego purse is to come from private individuals. The plan as outlined is for 100 sportsmen to give \$100 each, making one of the largest purses ever offered for a motor racing event on the Pacific coast.

TO CROSS CONTINENT IN DAY

Detroit, Mich., Nov. 23—To prove that the Lincoln highway now is in shape for transcontinental travel and that there is not a mile of the 3,400-mile thoroughfare which cannot be covered easily and quickly on prearranged schedule, the Lincoln Highway Association will hold a coast-to-coast run Friday. In the 12 hours between the rising and setting of the sun, every mile of road on the route between New York and San Francisco will be traveled.

Over 100 motorists have volunteered to take part in this extraordinary relay race for motor cars. Some will drive only a few miles. Others will complete a century or more. Payson W. Spaulding, state consul for Wyoming, is the most ambitious driver. He will travel the entire distance across his state to prove that the Wyoming link is ready for the tourist. The consuls in other states through which the transcontinental highway passes will take part.

CHAMBER MAY DEFEND SUITS

New York, Nov. 23—Special telegram—A special meeting of all the members of the National Automobile Chamber of Commerce has been called by President Clifton for Thursday, December 3, at which time the attention of the entire chamber will be drawn to the present litigation of the Kardo company on floating axle construction and other patents. It is expected that the chamber may consider the advisability of defending the suits brought against its members by the Kardo company.

NEW NAMES ON SHOW LISTS

New York, Nov. 23—Special telegram—Last week seven makers of electric cars were allotted space for the New York and Chicago shows as follows: American Electric Car Co., Saginaw Mich.; Anderson Electric Car Co., Detroit; Baker Motor Vehicle Co., Cleveland; Electric Car Co., Toledo; Rauch & Lang Carriage Co., Cleveland; Waverley Co., Indianapolis, and Woods Motor Vehicle Co., Chicago. All the above concerns with the exception of the American Electric Car Co. and Woods will exhibit at New York.

Two gasoline car makers were added—Chevrolet Motor Co. and Trumbull Motor Car Co., which will be at both shows.

Ten new accessory exhibitors have been added at Chicago, as follows: Charter Single-Sleeve Motor Co., Chicago; Gray Bros. & Co., Chicago; Lipman Air Appliance Co., Beloit; Mathiesen Spring Cushion Wheel Co., Chicago; A. J. Picard & Co., New York; Positive Supply Co., Davenport; William Shakespeare Jr. Co., Kalamazoo. At New York the following have been added: Eclipse Machine Co., Elmira; A. J. Picard & Co., New York; W. S. Sheppard, Newark, N. J., and K. G. Welding and Cutting Co., New York.

ONE-PIECE PLUG NAME CHOSEN

New York, Nov. 23—Special telegram—More than 3,800 names for a new spark plug were received by the Emil Grossman Mfg. Co. in its contest for a name for its new plug. R. F. Darby, 30 Church street, New York, and in the employ of the American Steel Foundries, suggested the winning name—One-Piece, which the judges today selected as the most appropriate one in that the plug really is a one-piece construction, as the insulation is cemented by a baking process into the shell, giving a plug without gaskets, etc. In all more than 2,200 letters were received in reply to the advertisements of the contest placed exclusively in the Class Journal Co. publications, Motor Age, Automobile and Motor World.

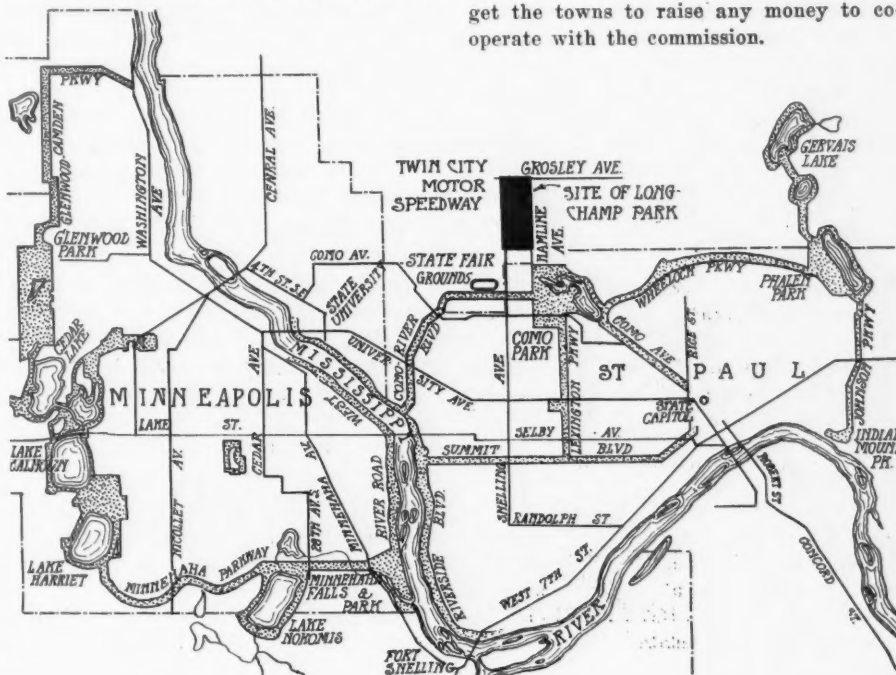
MAINTENANCE THE PROBLEM

Boston, Mass., Nov. 23—The annual meeting of the Massachusetts Highway Association was held in Boston last week and attended by more than 200 members from all over the state. Colonel William D. Sohier, the Massachusetts highway com-

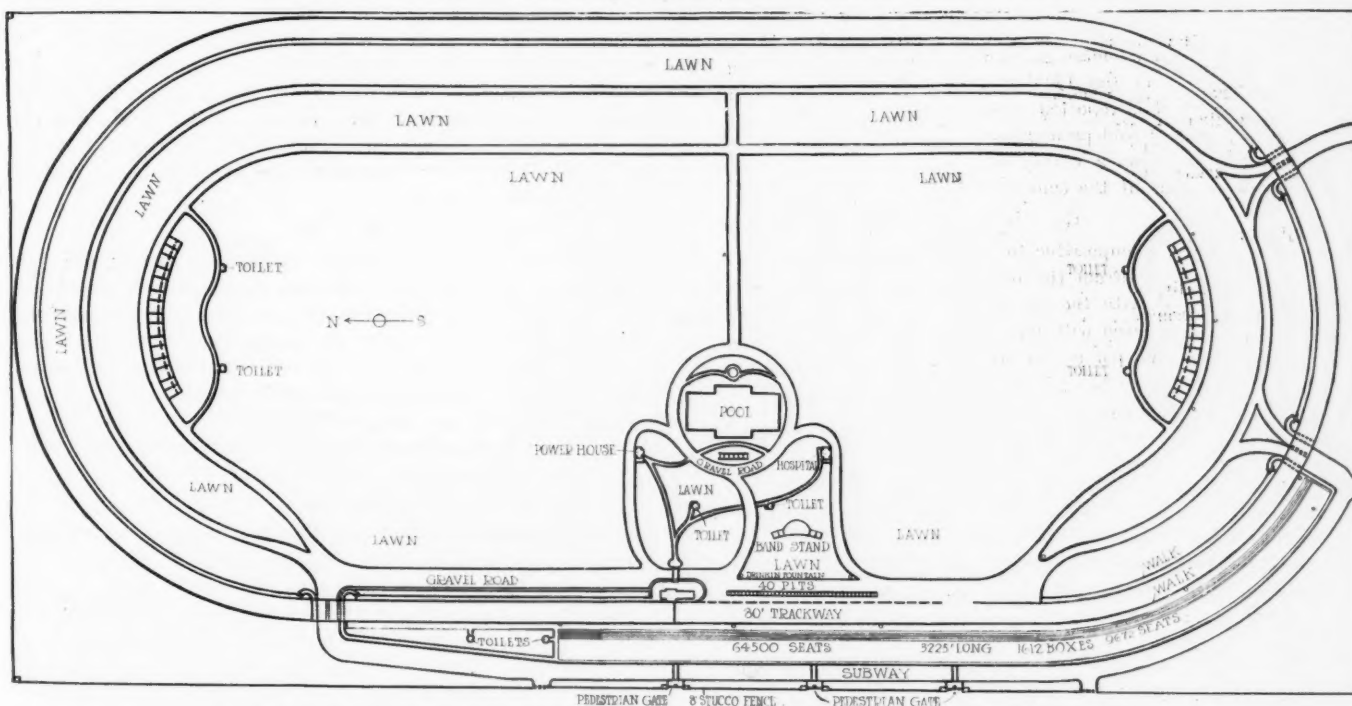
mission chairman, presided. Some interesting road problems were discussed, and it seemed to be the unanimous opinion of the speakers that the work of constructing new highways will have to be halted for a time in order that the various states may catch up with the work of maintenance. Highway Commissioner Bennett of Connecticut stated that there would be no new roads constructed in the next few years. S. Percy Hooker, highway commissioner of New Hampshire, stated that the coming generations would have to pay for what the present generation is enjoying in the

way of highways unless means were found to secure more taxes and not impoverish the states. Chairman Sohier stated that when the Bay state began building its roads some 20 years ago the bonds put out for the work were to run 30 years. Now many of the roads have been used up and the bonds remain unpaid. Therefore the problem was a serious one.

Paul D. Sargent, engineer of the Maine highway commission, stated that in Maine there is a big area with a small population, and in many places such a low property valuation that it is next to impossible to get the towns to raise any money to cooperate with the commission.



SHOWING PROPOSED LOCATION OF SPEEDWAY BETWEEN MINNEAPOLIS AND ST. PAUL



TWIN CITY MOTOR SPEEDWAY TO BE ERECTED BETWEEN MINNEAPOLIS AND ST. PAUL

It is planned to start work immediately on the new speedway. During the winter months excavations for subway bridges and course grading will be done and when milder weather sets in the actual concrete pouring will take place. It is hoped to have the track done for a Labor day meet next year. The speedway is to be 2 miles in circumference and 80 feet wide. Six-inch concrete poured on trap rock and gravel base will be the surface. The grandstands will be 3,225 feet long and give capacity for 74,172 spectators.



MOTOR AGE
Published Weekly by
THE CLASS JOURNAL COMPANY
910 SOUTH MICHIGAN AVENUE CHICAGO

NEW YORK OFFICE
239 West 39th Street

SUBSCRIPTION RATES
United States and Mexico
\$3.00 per year
Other Countries including
Canada \$5.00

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

Member of the Audit Bureau of Circulations

Looking Out for the Other Fellow

DETROIT is a city with a conscience. Feeling that it has a moral obligation to fulfill, it is preparing to meet it. The thousands of skilled workmen employed in the motor car manufacturing plants of the Michigan metropolis, the great batteries of lathes and stamping machines which throb with the spirit of industry daily, are responsible for the thousands of motor cars that have complicated the traffic problem in the large cities throughout the country. Having taught millions how to ride with pleasure, Detroit now aims to teach millions how to ride to safety.

THE Safety First Society of Great Detroit is about to launch a nation-wide campaign for the conservation of life and limb. There is nothing narrow, nothing selfish about Detroit. As a disciple of safety first, Detroit will not confine its energies to the small territory bounded by the corporate limits. Detroit has sent the motor car into every state in the American sisterhood. Detroit will preach the doctrine of safety first in each of the forty-eight commonwealths.

SAFETY FIRST is a crusade of altruism but in the proposed activities of Detroit, it will reach its supreme exemplification. Other cities are attempting to safeguard the lives and limbs of their residents, but Detroit aims to aid in the protection of all the citizens of all the states.

REALIZING that the motor car, epitomizing the energy of Detroit, is responsible for a large number of accidents on the public highway, Detroit will pay particular attention to the motor car in an effort to minimize the toll annually extracted by the self-propelled vehicle. Motorists have been asked to volunteer as patrolmen and report all infractions of the traffic rules and ordinances relative to speeding. Reckless drivers will be listed and kept under surveillance. If they persist in taking chances they will be reported to the police and prosecuted.

IN THE past, Detroit has played a prominent role in the solution of the traffic problem. The system of safety lanes for pedestrians now in vogue in the Michigan metropolis has been adopted by other cities in the state and have been found practical and a means of preventing serious accidents. In its wider safety first campaign, Detroit again will be a leader.

DETROIT plans to prove to the entire country that the highways can be made safe for both motorist and pedestrian if each shows the other the consideration that is due him. The success of safety first depends on whether or not every user of the highway accepts his responsibility in being "his brother's keeper." Detroit is determined to make everyone look out for his own safety and the safety of the other fellow as well.

The New Fuel

ALTHOUGH the new motor car fuel has given a creditable account of itself in the 1,000-mile test at Indianapolis last week, and although it is reported that it can be manufactured at 2 cents per gallon and sold perhaps at 6 cents per gallon in quantities, it is yet far from a reality as a practical motor fuel, to be sold in all sections of the country.

AT THIS time it is impossible to pass judgment on it, viewed solely as a fuel. From the tests it scarcely showed up as favorably as gasoline with the car carrying only two passengers and no top up as compared with gasoline in a previous test of the same car carrying five passengers and with top up. But here we cannot be definite, in that, being a relatively new fuel, it is but natural that it is not in that refined state that it may be possible to manufacture it in after more experience.

MARKETING a special fuel is one of the greatest difficulties, often a greater one than manufacturing. Our fire marshals have codes covering the methods of storing inflammable fuels; and if two fuels are to be carried in each garage it will mean a doubling of the present fuel-carrying facilities. It would be impossible to carry gasoline and the new fuel in the same tank. Separate tanks are needed. This question of merchandising is one of the serious factors against kerosene today. Granted that you had a car capable of using kerosene and traveling on it from New York to Chicago, the problem of buying such a fuel in quantities and at convenient places presents itself. The motor car is a universal vehicle and you must use a fuel that is on the market at all parts of the country all the time.

THE LOW price of the new fuel, a possible selling figure of 6 cents per gallon in quantities and a manufacturing cost of 2 cents per gallon, has been advanced as one of its great features. Everybody will welcome a lower fuel price, but in considering the price the car owner must not overlook the mileage per gallon that he gets out of the respective fuels considered, for that is a good criterion to go by.

SHOULD the new fuel eventually take a place side by side with gasoline, or should it or any other fuel become a leader, the entire industry would welcome such a blessing. Gasoline has gradually been reduced in price for the last 2 years, thanks to the discovery of motor spirit and the use of pressure distillation, which has made it possible to get double the amount of fuel out of a gallon of crude that was previously obtained. It may be that further progress can be made in this respect, and if so the motor world will welcome it.

THE PRICE that an owner pays for fuel is determined largely by the garages which sell it. There was a time a few years ago when garages were buying gasoline at less than 8 cents a gallon in quantities and retailing at 25 cents per gallon. Thanks to the curb-side pump, the garageman has had to cut his prices, and the active entry of the large gasoline-producing companies into the curb-side business has lent a different aspect to the gasoline business during the past few months. It may be that gasoline can be very considerably reduced so far as the price the consumer must pay, all of which of course would be agreeable to the consumer of the fuel.

Another Way of Estimating the Cost of Bad Roads

McLean County, Ill., Motorists Pay \$250,000 Per Annum

BLOOMINGTON, Ill., Nov. 23—It has been conservatively computed that the ill-maintained country roads of McLean county, ranking as one of the wealthiest of the United States, cost car owners \$250,000 per annum. The cost of maintaining a motor car is largely dependent upon the condition of the highways over which the machine is compelled to travel. It is conceded that 90 per cent of the tires in use are not actually worn out in service, but are destroyed before their allotted time by the bruising they receive in pounding over rough roads and in striking obstructions, such as high crossings, bridges, and culverts.

There are about 3,000 cars in McLean county and it is safe to assume that each one costs its owner at least \$30 more per year for casings destroyed, due to road conditions, than it should, or a total of \$90,000. It also will be conceded that a large part of the breakage on cars is caused by crystallization, due to vibration set up in driving over bumpy roads. This same cause is responsible for a large number of the bearings destroyed before their time. In truth, it is the big factor in the destruction and depreciation of everything about a car from the radiator to the rear axle. It is safe to assume that the extra cost imposed upon car owners for needless breakage and replacement of parts, is at least \$50 per year per car or a total of \$150,000.

This added to the \$90,000 per year for extra and unnecessary tire destruction, brings the total to \$240,000 per year or enough to pay interest at 5 per cent upon \$2,000,000 worth of bonds and leave a surplus to retire more than \$150,000 a year of the principal. These figures are by no means overdrawn. If anything, they are too conservative.

What is true of the cost to the user of motor cars is equally true to the owners of all other types of vehicles in lesser proportion. Despite this, there are some people who maintain that it will not pay to construct smooth, permanent highways, because the expense is too great. It is only a question of whether the public prefers to pay the freight and retain the present type of roads, which are as obsolete as a one-cylinder motor car, or whether it is best to spend the money in the construction of modern highways that will repay many times, their cost.

IMPROVING PICTURESQUE ROUTE

Louisville, Ky., Nov. 21—Following the receipt of news that Rockcastle county would begin work on the road in the spring, and that a movement had been started in Bell county for reconstruction of the highway, efforts to bring about the reconstruction of Boone way throughout

the counties of Rockcastle, Knox, Laurel and Bell will be made by the Louisville Automobile Club and the Kentucky Good Roads Association.

In a letter to Eugene Stuart, secretary of the Louisville Automobile Club, Judge T. J. Asher, of Bell county, stated that in Bell county preparations are being made to grade and macadamize Boone way throughout the county.

The route of Boone way extends from Crab Orchard to Cumberland Gap. From Crab Orchard to Mt. Vernon, in Rockcastle county, Mr. Stuart has been informed, work on the highway will be started in the spring.

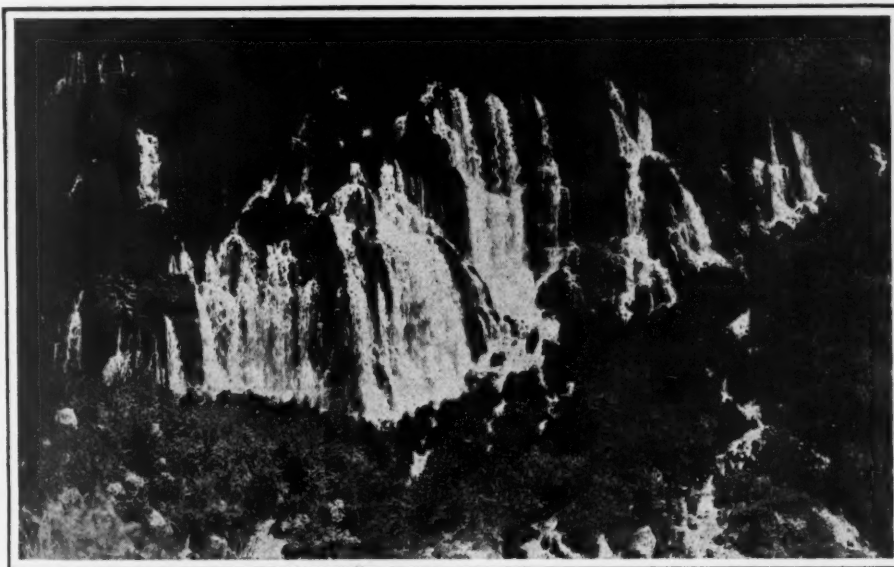
The purpose of the campaign to be waged by the motoring organization and the good roads body will be to interest all counties through which Boone way extends in the matter of state-aid funds, soon to be available. A suggestion has been made to the motor club to conduct a scouting expedition along the route to spread good roads propaganda and this plan is under consideration.

Robert E. Woods, director general of the Kentucky Highway Association, has arranged for a series of meetings in towns along the Boone way, at which he will make talks on the project and good roads.

The proposed improvement of Boone way, from Crab Orchard to Cumberland Gap, would provide an inlet, from the roads now macadamized in the central counties, into an exceptionally picturesque section of the Kentucky mountains. No little benefit to the counties traversed would arise from the tourist travel alone.

The justly famous Bluegrass region now offers the tourist the only extensive mileage of really good roads in the state. It is a section which has had improved roads for the better part of a century. The limestone highways have both reflected and affected the welfare of the group of counties of which Fayette is the hub. To the heart of the highlands is but a short crow's flight from the limestone roads of the counties bordering the foothills of the Cumberlands. But the way is tortuous and torturing over the roads that exist.

See America First —
• • • See America Now



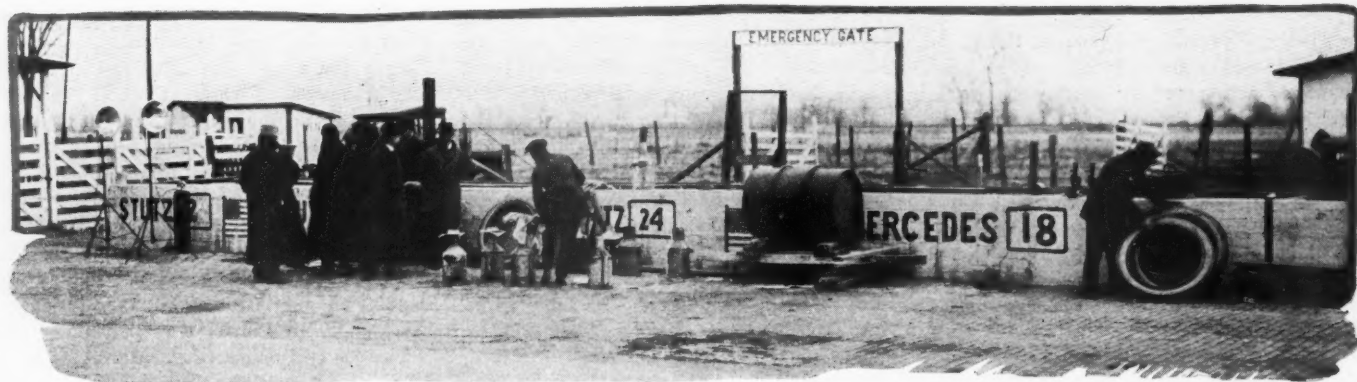
EDITOR'S NOTE—This is the second of a series of illustrations and thumb-nail sketches of the scenic and historic wonders of America to be run in Motor Age with the idea of calling the attention of motorists to the picturesque points of interest in their own country.

NO. 2—LOST RIVER OF ONE THOUSAND SPRINGS, WENDELL, IDAHO

Tourists who follow the Oregon trail in their "See America First" journey, will come upon a natural phenomenon near Wendell, Idaho, which is as beautiful as it is mysterious. Out of the side of a small mountain gushes the waters of a thousand springs, a thousand miniature Niagaras dashing over the rocks. They are the outlet of a lost river whose source is unknown and whose underground channel has worn its way through the mountain after centuries of persistent effort.

New Fuel Given 1000-Mile Test on the Speedway

Marmon Averages 50.2 Miles Per Hour in Demonstration



Scene at the pits during the 1,000-mile test of the new fuel. Drum in center of picture contains gasoline substitute made outside speedway gates

INDIANAPOLIS, Ind., Nov. 20—One thousand and thirty miles at an average speed of 50.2 miles per hour, including stops, was the record made by the Marmon 41 touring car and the new synthetic gasoline at the speedway today and yesterday. The 2-day test under official supervision of the American Automobile Association proved beyond a doubt that the new fuel is thoroughly applicable to motor cars—this was the object of the test—but it also proved the stamina of the Marmon car.

Following so closely after the Marmon speed trials of last week, in which the hour records for a stock car were broken, by the same car, the 1,000-mile run puts another feather in the cap of the Nordyke & Marmon Co. The fact that the last 100 miles was covered at a rate of 61.1 miles per hour and that the fastest lap of the 2-day trials was the next to the last one shows the running condition of the car had not been affected by the long grind or by the use of the new fuel.

The object of the test was to determine the effect on a motor car engine of the use of the new fuel in which Carl Fisher, Howard Marmon, Henry B. Joy and a number of other manufacturers are interested. This is made by a distillation process from a number of secret chemicals, though water and naphthalene, of which moth balls are made, are known to be the chief constituents. It can be manufactured, it is claimed, at a cost of 2 cents per gallon and is expected to sell in quantities at 6 cents per gallon. The results of the original demonstration and a description of the new fuel were given in *Motor Age* July 9.

Properties of New Fuel

It is not impossible that this new fuel will be produced in marketable quantities in a short time. It seems to have all the qualities of gasoline, except the latter's characteristic smell and the probability that it acts rather as a decarbonizer than the opposite.

Yesterday and today's test was under the supervision of F. E. Edwards, technical representative of the American Automobile

By Darwin S. Hatch

Association, assisted by Chester Ricker, technical representative of the Indianapolis motor speedway. The test was timed electrically by a new timing instrument, the invention of Ricker. Tomorrow Edwards and Ricker will tear down the engine to ascertain the effect of the use of the new fuel on the pistons, cylinders and valves of the engine.

Weather Too Cold for Comfort

Weather conditions for the test were anything but favorable. The thermometer hovered around 15 degrees above zero during the morning and was below freezing all day. A sharp cold wind was blowing and this caused some difficulty the first day, making it necessary to stop several times to clean out the fuel lines. This was because, in the hurry to get started, straining of the new fuel was omitted and the water which is carried over in the fuel in the present unrefined method of manufacture, became frozen. After the fuel was strained no further difficulties from this source were encountered. Weather conditions also made frequent changes of driver and mechanic necessary, as the biting wind made continued driving impossible at speed.

Only two tires were changed during the run. The car was shod with Goodrich Sil-

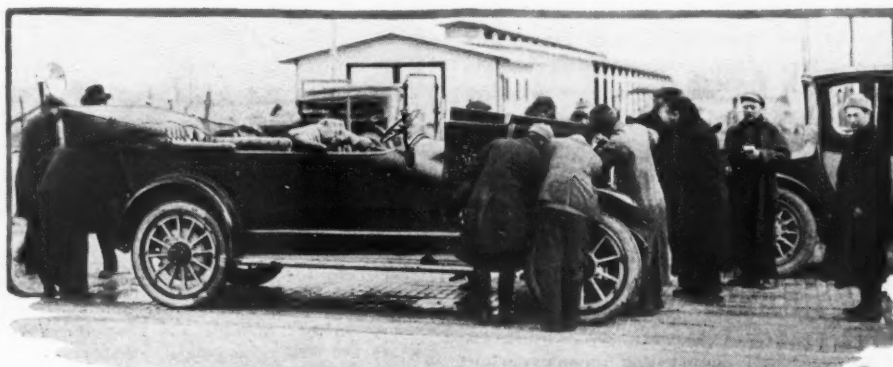
vertown cords. There were no mechanical difficulties except the breaking of a valve spring and the necessity of changing one spark plug and the car seemed to be hitting as well on its last lap as at any time during the test.

The fastest lap made throughout the test was the next to the last, in 2 minutes 21 seconds, an average of 62.85 miles per hour. The first 100 miles was made in 1:54:50.8 an average of 52.3 miles an hour. Taking out time for stops, the 1,030 miles was covered at an average speed of 55.95 miles an hour.

The drivers were Ted Collier, tester for the Marmon company, and Vere Barnes, who was Joe Dawson's mechanic in the last 500-mile race. Only the driver and mechanic were carried, the top was folded down but the windshield was up.

Car Hero of Hour Run

The car which made this test was the same car which performed in the hour trials on November 12, the only change being the addition of an oil tank placed in the tonneau and connected to the oil reservoir under the motor, so that oil could be forced into this oil reservoir while the car was in motion. The car was a model 41 Marmon, five-passenger, and had as stock equipment including Stromberg carbureter, Stewart vacuum fuel feed, Bosch magneto, and Goodrich Silvertown



Officials examining Marmon 41 at beginning of 2-day run on new fuel

cord tires. Among those who witnessed the test were: A. R. Pardington, of the Lincoln Highway Association; Russell Huff, of the Packard Motor Car Co.; Howard Marmon, of Nordyke & Marmon; Carl Fisher, of the Prest-O-Lite company; Guy Wall, of the National company.

Technical Committee Report

Indianapolis, Ind., Nov. 21—Examination of the engine of the Marmon 41, which completed the 1,030-mile run on the Speedway yesterday with synthetic gasoline, as fuel showed that there were no ill effects from the use of the fuel. F. E. Edwards, technical representative of the contest board of the American Automobile Association, and Chester Ricker, technical representative of the Indianapolis motor speedway, examined the car today and made the following report:

"At the completion of these trials the car was sealed by the technical committee and driven to the Marmon factory where the cylinders and carburetor were taken off, the valves taken out to observe the character of the deposits in the cylinders and around the piston heads, on the tops of the valves and valve seats, and to see what, if any, action had been caused by the use of the fuel. As far as the committee could determine, the metal parts of the engine were remarkably clean, showing very little more deposit than was in this same engine at the completion of the 1-hour trial on November 12. Also, no deterioration of these metal parts due to any chemical action was to be observed with the eye."

National Did 17.2 Miles to Gallon

Chicago, Nov. 21—Motor Age made the statement in the issue of November 18 that in a comparative test of the new fuel last summer a National six ran 12.5 miles on a gallon of this fuel and 15.2 miles on a gallon of gasoline. The fuel used in that test was produced before the still was working properly and the mileage did justice to neither the new fuel nor to the National car. Subsequent tests with this fuel in the same National six showed a mileage of 17.2 on a gallon.

U. S. ARMY TESTS TRUCK

San Francisco, Cal., Nov. 20—In order to prove the value of motor trucks in the United States army, in hauling supplies, A. White, San Francisco, representative of the Sternberg truck, recently placed one of his 2-ton trucks at the disposal of the artillerymen who were in the field as infantrymen for 10 days that they were working out the problem of defending the city from a landslide.

The troops camped at Tanforan, Colma, Halfmoon Bay, San Mateo and Milbrae during their maneuvers, and every day they were out the truck furnished gratuitously by White made trips from the city of San Francisco and the Presidio reservation to the camp, carrying forage for the eighty animals with the soldiers, fresh meats and all other necessary rations for



Officials and timing instrument in speedway test. At right is F. E. Edwards, technical representative of the A. A. A. At left is the timing instrument and its inventor, Chester S. Ricker

the troops. The truck made trips with clockwork regularity and did not once fail in bringing down the necessary fresh rations.

"There is not the slightest doubt in my mind," said Captain Geary, "that several motor trucks at Fort Winfield Scott would pay their own way month in and month out in peace times, and in time of war would be tremendously effective not only in transporting rations to men in the field near their base of supplies, but in hurrying men and artillery to critical points. A 2-ton truck will do the work of twelve mules, and the time saved by the use of the motor vehicle is a big item."

It is authoritatively stated that bids for motor trucks for Fort Scott and the Presidio soon will be asked by the government, and that the purchase of a few of these within a short time will form the entering wedge for their more universal use by troops.

DROP FORGE MEN ORGANIZE

Detroit, Mich., Nov. 20—Factory superintendents and shop men from American and Canadian drop forge manufacturing concerns met here yesterday and formally organized the American Drop Forge Association.

A preliminary meeting was held several weeks ago with this organization in view and the officers then suggested were elected at yesterday's meeting. These officers are: R. R. Ellis, superintendent Detroit Forging Co., Detroit, Mich., president; George Des Autels, manager Anderson Forge and Machine Co., Detroit, Mich., vice-president; A. E. Dibble, manager Frost Gear and Forge Co., Jackson, Mich., secretary; E. B. Horne, superintendent Packard Motor Car Co., Detroit, Mich., treasurer.

An executive committee was then named consisting of the following men: E. Ingalls, Ingalls-Shepard Forging Co., Harvey, Ill.; M. Henry, Henry & Allen, Auburn, N. Y.; C. A. Prochler, Canton, O.; R. Herdgen, Dominion Stamping Co., Walkerville,

Ont.; and E. B. Horne, of the Packard Motor Car Co., Detroit.

"The object of this organization," said Vice-President Des Autels, "is to bring the factory and shop men in the drop forge industry together. It must not be misconstrued that the manufacturers have organized. As a matter of fact we managers and superintendents have not asked the manufacturers what they thought about the idea and we took steps among ourselves because we found it advisable that we should get better acquainted as to matters concerning the shops. We want to better conditions for the shop men, we desire to discuss our mutual methods and improve them, to get-together from time to time at meetings similar to those of the Society of Automobile Engineers, and especially, to promote better efficiency among the men." The following concerns have already joined the new organization:

Champion Machine and Forging Co., Cleveland, O.; Henry & Allen, Auburn, N. Y.; A. O. Smith Co., Milwaukee, Wis.; Scranton Forge Co., Scranton, Pa.; Herbrand Co., Fremont, O.; Packard Motor Car Co., Detroit, Mich.; Frost Gear and Forge Co., Jackson, Mich.; Indianapolis Drop Forging Co., Indianapolis, Ind.; Anderson Forge and Machine Co., Detroit, Mich.; Atlas Drop Forge Co., Lansing, Mich.; Dominion Stamping Co., Walkerville, Ont.; Cortland Forging Co., Cortland, N. Y.; Detroit Forging Co., Detroit, Mich.; Ingalls & Shepard Forging Co., Harvey, Ill.; Canton Drop Forging & Mfg. Co., Canton, O.; Columbus Forge and Iron Co., Columbus, O.

There were representatives present from a dozen other concerns which will join shortly and by the time the next meeting is held, which will be in Chicago, during the week of the show, it is expected that a majority of the drop forge manufacturing concerns in the United States and Canada will have joined the organization.

DEATH OF ALLEN S. RAY

Chicago, Nov. 23—Allen S. Ray, former president of the Chicago Automobile Club and donor of the Ray trophy in the fall interclub team match between the Chicago Automobile Club and the Chicago Athletic Association, died today after a lingering illness.

Garage Men Gain Point at Albany

Delay Granted in Fire Law Enforcement

ALBANY, N. Y., Nov. 18—The regulations governing changes in structure of garages and repair-shops recently promulgated through the state of New York by Thomas J. Ahearn, state fire marshal, and which regulations were to take effect December 1, have been temporarily held up, due to a conference in the state capitol today at which the Automobile Trade Association of New York showed why the present regulations are unjust, inconsistent and in many cases would work very serious injury to existing garages in the state. As a result of today's conference the existing regulations will not go into effect December 1 and it is probable they will not be enforced at all in their present manner. On December 9 there will be another hearing before the state marshal at the capitol here when the officers of the state dealers' association will meet with the state fire marshal to revise the present code.

At today's hearing President R. H. Johnston, of New York city, and head of the state dealers' association, read letters from Rochester dealers showing how the Rochester fire marshal had notified them that their garages were violating the new code and that alterations must be made before December 1. Practically every garage in Rochester had received notification covering improvements on the ceiling of the garages, requiring metal lath and $\frac{1}{4}$ -inch of plaster; also notifying them that the repair-shop must be separated by a fireproof wall with automatic fire doors from the garage proper; also that staircases and elevators must be inclosed in fireproof partitions with automatic fire doors; also that metal window frames and sashes with wire glass must be changed, etc., etc.

It was shown that one dealer would have to make an expenditure of \$6,000 on his garage in order to conform with the new requirements, and that these changes could not be made inside of 8 weeks, although only 2 weeks were given in which the work was to be done and if not completed at the end of that time action would be taken towards closing the garage according to the regulations.

This danger now has been overcome and the probabilities are that the final draft of garage regulations will be entirely rational and not work a hardship on any garageman with the exception, perhaps, of those who have located in one-time livery stables which have not been brought up to rational fireproofing standards.

Today's hearing demonstrated conclusively that there are many unfeasible rules in the existing regulations. One is that a torch cannot be used in a repair-shop, the idea of the regulations being that there would have to be a separate fireproof room in one corner of the repair-shop. The

torch, forge, etc., would have to be used in this fireproof room and this room would not have a door into the repair-shop but only one leading into the outer air.

It was shown that this was impossible in many existing modern garages built in entire accordance with the existing fire laws previous to the recent code which the state fire marshal had circulated. If there is to be a fire door between the repair-shop and the garage, and if gasoline is not permitted in the repair-shop, then there is no reason why the open torch or the forge should not be permitted without restrictions in the repair-shop.

When the revision takes place it is certain that there will be a new classification of garages instead of the promulgated one.

Charles Thaddeus Terry in arguing the case for the New York dealers drew attention to the general lack of feasibility existing throughout the new draft. He attacked the basis of garage classification on the ground that it was unfair and irrational. He cited one case where an existing garage has a cement floor $2\frac{3}{4}$ inches thick but according to the promulgated regulations this should be 3 inches thick and that it would be impossible to lay an additional $\frac{1}{4}$ inch and have a satisfactory floor.

The regulation requiring that heating boilers be located in a room with an entrance only leading to the outside air was shown to be impracticable in many existing fireproof garages.

MAY NOT NEED SEPARATORS

Boston, Mass., Nov. 23—Fire Hazard Commissioner O'Keefe, who held a conference with garage owners and motor dealers last week, went on a tour of inspection today with President J. S. Hathaway and Secretary Chester I. Campbell of the Massachusetts Garage Association to get first-hand information before putting into effect any new regulations about separators as proposed. The commissioner visited every big garage in Boston and vicinity, and also the service departments of the prominent dealers. He asked many questions as to the amount of gasoline used, and the uses to which it is put. In many places he learned that no gasoline at all is used except to fill tanks of motor cars, kerosene being used instead.

Following the tour the commissioner said that he had learned a great deal about garages and that he was not sure that separators were a necessity. He asked the garage officials to select from among the men they talked with during the tour a committee of five to meet him later and suggest practical rules to minimize the fire danger, and what can be done to prevent gasoline getting into sewers, leading to explosions.

One of the results of the hearings and the tour will be the introduction in the legislature next year of bills to control the sale of gasoline from garages and elsewhere to householders so that it will be impossible for it to be used indiscriminately and then poured into sewers, and have the blame be placed on garage owners and motor dealers.

PHILADELPHIA TRUCK MEN TALK

Philadelphia, Pa., Nov. 23—Emlen Hare, of the Commercial Truck Co. of America, who spoke on the correction of present evils, particularly those involving bad salesmanship; L. J. Eastman, of the Eastman Motor Truck Co., who urged better care of trucks on the part of users, and E. M. Bartlett, of the Stanley Motor Carriage Co., who pointed out the bad policy of excessive promises in connection with guarantees, were the principal speakers at the monthly meeting of the Motor Truck Association of Philadelphia recently held in the Hotel Adelphia.

EAST MAY TOUR TO PACIFIC

Boston, Mass., Nov. 21—Former President Lewis R. Speare of the A. A. A., and now president of the Massachusetts State A. A., is sounding out motorists in the Bay state relative to a motor tour from Boston to the Pan-American exposition next summer. The plans are to defer the A. A. A. meeting scheduled for December at Boston until some time along about May. Then following the meeting it might be possible to start a caravan of cars across the continent. The Glidden trophy is now in Boston, where the Metz company of Waltham, Mass., has it on exhibition at its salesrooms on Boylston street, and it might be possible to work out some idea for a tour for which the trophy could be put up as a prize. Another alternative would be the offering of medals to those who completed such a run, gold medals to all who went to the exposition and back, and silver and bronze medals to those who made a one-way trip. As many western people come to New England every year, particularly to Massachusetts, it is believed that arrangements could be made for many of them to join in such a tour on its return trip from the Pacific coast.

HUB SEEKS TO ABATE NOISE

Boston, Mass., Nov. 21—Massachusetts motor organizations are planning a campaign to have the law regarding blowing horns changed so that there will not be such a constant din in the city streets day and night. Under the law the driver must blow the horn at every cross street where the view is obscured, also to warn pedestrians of danger. Another section states that it must not be sounded so as to make a harsh, and unreasonable noise. But when a driver is in the thickly-settled part of the cities he must blow the horn every few feet because of the cross streets. It is believed that if the law were changed so as to leave the matter to the judgment of the

driver the result would be better, for then he would not blow every few seconds unless it were absolutely necessary. Motor officials believe that there would be fewer accidents, for the driver would have more chance to attend to the steering in close places. It is pointed out that the law allows the driver to use reasonable judgment relative to speed with good results, and the same could be worked out in reference to blowing the horn.

HOLDS CAR OWNER LIABLE

Boston, Mass., Nov. 21—Do not loan your motor car to anyone unless you are satisfied to assume the responsibility for any accidents is what the Massachusetts law says as a result of a recent decision in the court at Boston. Edward W. Arnold owns an attractive camp at South Weymouth, and he uses a motor car there a great deal. In May, 1912, he had as guests there Miss Annie M. Blackwell, of Rockland, and Elsie M. Taylor, of Weymouth. They coaxed him to take them for a motor ride, but he did not care to go. But feminine pleading was so strong that finally he threw the key to his garage to them and the girls went for a ride with Harry L. Thompson, another visitor. Mr. Arnold knew that Thompson could drive the car, and that he had a license. On a road in Mansfield on their return, after they had picked up another passenger, Miss Beryl Binine, they ran down a team driven by Harry W. Campbell. The latter was injured and he brought suit. The court held that Arnold was liable for damages when he knowingly allowed Thompson to take the car and Campbell was awarded \$600 and costs.

QUAKER SPACE RESTRICTED

Philadelphia, Pa., Nov. 21—Owing to inability to secure adequate quarters to accommodate all the would-be exhibitors at the forthcoming show of the Philadelphia Automobile Trade Association that organization has been compelled to adopt a plan restricting the amount of space to be allotted. In order to secure a representation of the greatest number, any member handling but one make of car will be limited to 400 square feet of exhibition space. An additional 200 square feet will be optional to those handling two or more makes.

RHODE ISLAND SHOW A WINNER

Providence, R. I., Nov. 21—All the dealers who had exhibits at the Rhode Island show which ended here this evening were well pleased with the results. There was a good attendance throughout the week, and it was the consensus of opinion that the show helped business a good deal. There were a number of sales made, particularly of the smaller cars and of the closed machines. The men handling the big makes said that they were satisfied with the results. Agencies were closed for several of the towns and cities on the outskirts of Rhode Island and southern Massachusetts and eastern Connecticut.

Detroit Enthuses Over Safety First Plans Made to "Look Out for Other Fellow"

DETROIT, Mich., Nov. 20—Beginning January 1, 1915, the Safety First Society of Greater Detroit will inaugurate a most extensive, complete and comprehensive educational campaign of safety. The campaign will be divided into twelve departments or divisions, namely: newspapers, schools—public, parochial and private—boys' organization, motion picture houses, motion picture lectures, car owners, playgrounds and boy scouts, industrial plants, district societies, visiting nurses, churches and placards.

The newspapers will be used to advertise safety-first suggestions and give statistical information on the progress of the Safety First Society, while in the news columns it will be endeavored to have published any matter which might help the safety first movement.

In the schools the campaign is to be conducted through talks and general instruction on safety matters by the teachers, by the issuance of special illustrated bulletins written and prepared in such a way that they will appeal to the children. The older school children are to be organized into patrols to look out for the safety of the younger ones. There will be a suggestion-box in each school and the pupils will be asked to write suggestions on the safety subject.

A request will be addressed to motion picture firms to run safety-first motion pictures to be selected from pictures already on the market.

Lectures to be accompanied with motion picture films are to be made in school and in other places for the benefit of children and grown-up persons as well.

Cards with the rules and regulations to govern them are to be sent to all car owners and are to be given to each applicant for a license. The motorists will be asked to co-operate with the society and will be requested to report any infraction of the traffic rules or of the motor ordinance. The number of the car of reckless drivers is to be reported to the society where an index file or report will be kept. If a driver is reported a second time a complaint will be lodged against him with the police department. An effort will be made to form a special squad among owners who will be asked permission to use their cars to catch speeders and reckless drivers. It also may be decided to ask a number of members of the Wolverine Automobile Club to act as special safety-first society representatives and act as special policemen for the society.

Nine boys of the boys' department of the Y. M. C. A. are to be taught the safety-first rules and regulations and they in turn are to teach them to a number of other boys who in turn are to educate other

boys, so as to make it an endless educational chain among boys. The same suggestion will be made to the Y. W. C. A., as the girls should be given the same needed information as the boys in this campaign.

A safety first exposition is to be prepared at the Y. M. C. A. at which all kinds of outdoors and indoors accidents are to be shown in a graphic manner, through the medium of charts, photographs, miniature models and tableaux in which boys are to take part. In this exposition street car, motor car and horse-drawn vehicle accidents are to be shown, also accidents on railroad tracks, poison accidents, accidents caused by fire.

In the churches there is to be a safety first Sunday to be started about 3 months after the general campaign opens. The pastors will be asked to deliver a sermon on the safety first subject once in a while and the co-operation of the Sunday schools will be asked.

The district societies are to be formed for the purpose of investigating the conditions of the streets, boulevards, roads and report any dangerous places, either for pedestrian or vehicle traffic. The members of the society also are to watch drivers of all sorts of vehicles and report their behavior if necessary to the general headquarters.

Visiting nurses will be asked to aid the movement and look out for the safety of children.

A series of placards or posters are to be prepared which will be relative to the safety-first movement and will as much as possible be so impressive that people will be attracted by them and read them.

A booklet will be prepared containing the rules and regulations to be followed by pedestrians and drivers and there will be statistics compiled from city records and from other sources, concerning accidents, etc.

In all factories or plants safety societies are to be organized among the factory employees.

It will be the further aim of the Safety First Society of Greater Detroit to have every Detroit, man, woman or child, become a member of the society upon the payment of a small annual fee.

ERROR IN GRAY & DAVIS PRICE

In the description of the Gray & Davis cranking and lighting system for Ford Cars, which appeared on page 30 in Motor Age last week, it was stated the system sells for \$110 with all accessories including the lamps. This is an error as the lamps are extra, the system comprising generator and motor, battery, wiring and all connections.

Motoring Zones of Australia and New Zealand

American Describes Attractions He Discovered



SPLENDID STRETCH OF ROAD IN NEW SOUTH WALES

IN no other country in the world perhaps do the people devote more time to the enjoyment of wholesome sports than in Australia and New Zealand. Besides the many private enterprises that have for their purpose the affording of pleasure for both young and old of the cities and many of the rural districts, the governments of the different states are active in rendering assistance in this direction.

With the advent of the motor car as a combined business and pleasure vehicle, a new avenue was opened for the enjoyment of outdoor life in the lands of the antipodes. This is particularly true as to Australia, where the climatic conditions and other essentials that enter into the pleasures of motor car excursionists are specially favorable for that character of diversion.

Many Beauty Spots Abound

While Australia is lacking in grand mountain scenery such as characterizes the western portion of the United States, it possesses many interesting and attractive beauty spots that are easily reached by comparatively good roads and without any extraordinary exertion on the part of the motor car excursionist. The so-called Australian Alps in the state of New South Wales, with its locally famous Mount Kosciuszko, which rises to an altitude of 7,328 feet, it being the highest point on the continent, bear little resemblance to the giant and imposing Rocky mountain ranges of America. However, much of that which is lacking in grandeur is made up in emerald beauty.

The precipitous hills that border por-

By W. D. Hornaday

Editor's Note—W. D. Hornaday is Motor Age correspondent in Texas and recently made an extended tour through Hawaii, Australia and other far-off countries.

extending all through the states of Victoria, N. S. W., and Queensland, are covered with a riot of verdure that is pleasing to the eye and lends to the air a fragrance that can be likened to a veritable garden of flowers.

Australian Road Systems

Leading out of all the principal cities, such as Brisbane, Sydney, Melbourne, Adelaide and Perth, are systems of highways that extend into the interior and along the coast as far as land settlements and development operations have been carried on. Many of these roads are sadly lacking in attention. This seems to be particularly the case in the Sydney territory, where there has been for sometime past an earnest agitation on the part of car owners and others for the adoption of some concerted plan on the part of the government for the improvement of the highways. This general lack of laws and system for the construction of good roads in the different states does not work as much of a hardship as one might suppose for the reason that the natural roads are, for the most part, very serviceable. It is only during the rainy season that general motor car travel can not be done throughout the settled portions of the country.

One of the surprises of my visit to Australia was the splendid system of good

roads that converge into the beautiful and thriving city of Adelaide, the capital of South Australia. Connecting the wide paved and well-kept streets of Adelaide are splendidly laid out highways that run to other points on the coast and mount with easy ascent the low bordering mountains that are known as Lofty range. These mountain roads wind in and out among the hills, traversing intervening cultivated valleys covered with orchards of oranges, almonds and a variety of other tropical trees and passing through many picturesque villages forming a series of loops that makes a tour through that region wonderfully enjoyable. In fact, Adelaide and its environs resemble to a marked degree Los Angeles and the territory adjacent to the latter city. Climate and other conditions of the two places are also very similar.

No Transcontinental Touring

Trans-continental motor tours are, as yet, among the things in Australia which are regarded as impossible. There is no railroad connecting the eastern portion with the western part of that island continent, but one is now under construction by the commonwealth government, and it is expected that it will be finished and in operation within the next 3 or 4 years. It also is proposed to construct a north and south continental railroad that will connect Darwin on the north with Adelaide on the south.

What is considered as the unsurmountable obstacle to making a trans-continental motor journey is the vast region in the interior that must be traversed. It

is considered probable; however, that the construction of the through railroad will bring about the development of a motor highway the whole distance.

With an area of a little more than that of the United States, exclusive of Alaska and the colonial possessions, and having a population of fewer than 5,000,000 people, Australia has taken remarkably high rank as a buyer of motor cars. While the people there use them primarily for pleasure, they are performing good services in many lines of business, not only in the cities but in the rural districts. In the state of New South Wales the tourist department of the government has mapped out a number of motor tours and is energetic in the matter of creating an interest in this character of outdoor enjoyment. In a statement of the subject, Percy Hunter, of Sydney, director of the government tourist bureau, said:

Motoring Growing Popular

"Motoring increases in vogue each year, and for a country so rich in magnificent tourist districts as New South Wales, good roads are as essential as railways, tramways or ferries. And in the matter of communication, the state is abreast of the times, and as up to date as any of the great tourist countries. Besides the splendid systems of railways, tramways and ferries, which have no superior on earth, the whole state is cobwebbed by roads radiating from the obelisk in Macquarie place, Sydney, from which point all road distances are measured. Having in view the enormous length of road in so large a territory so sparsely populated as New South Wales, the general conditions of the

state's roads are good, and easily negotiable by motorists. In the mountainous districts the grades and surfaces present no insuperable difficulties.

"Perhaps the finest extended motor trip, picturesque George's river at Tom Ugly's point, where a punt is available for the crossing. The tour through the country may now be said to have begun, as from the river level the road is lined on either side by scrub and timber. By an easy grade and surface it ascends to Sutherland, thence skirting for several miles the western boundary of National park.

"This magnificent recreation ground, covering an area of 36,000 acres, is one of the beauty spots of the state. Along the banks of the Port Hacking river, which intersects it, are many delightful picnic grounds, in shady ravines and secluded bowers. Just beyond the park is Waterfall and a few miles further away on the left lies the busy little mining town of Helensburgh. About this point the road divides, the Bottle Forest road, which is loose and sandy, branching to the right, and leading to the top of Bulli pass; the left hand, or lower road, is much preferable. This latter road, just beyond Oxford, a township invisible from the track, drops steeply down the Bald hill to Stanwell park.

Bald Hill Panorama

"The panorama from the Bald hill is surpassed only by the view from the famous lookout at Bulli. The vision takes in a great extent of ocean and shore line, forest, meadow and mountain. The road here is most picturesque, and for some miles past Clifton, Thirroul, Bulli and on

to Wollongong, it skirts the ocean front, circling round forbidding cliffs, or running along level stretches edged by sandy beaches.

"Pressing on to Nowra the road is well defined, for the most part undulating, and for excellence of road, continuity of interest, magnificence and diversity of scenery, and conveniences of travel, is from the capital via the south coast to Eden; thence to Cooma on the southern plateau via Bemboka and Nimitybelle, and across the Monaro plains and the Australian Alps to Kosciusko, Yarrangobilly caves and Tumut; returning via the Riverina and Southern Highlands through Gundagai, Jugiong, Yass, Goulburn, and Moss Vale. The aggregate of distances between points on this splendid round tour is 925 miles. It may be taken in easy stages, and there are ample facilities for replenishing gasoline supplies, and good hotel and garage accommodation is obtainable.

Through Fine Dairy Country

"Starting from Sydney the road runs through the closely settled Illawarra suburbs, and at 12 miles reaches the picturesque an extensive tract of splendid dairy country, of which Dapto, Shellharbor, Kiama, Gerringong and Berry are the chief centers. Between these points the road is undulating with good surface. Just before reaching Nowra it crosses the broad Shoalhaven valley, a level stretch of great fertility and quaintly picturesque, intersected by the noble river, and hemmed in on the west by a chain of hills. Nowra is the terminus of the railway, and marks the southern boundary of the Illawarra district.



PULLING A CAR THROUGH THE MIRE NEAR ALBANY, AUSTRALIA

"The lower south coast, lying between Nowra and the southern extremity at Cape Howe, is not so well known as the upper portion in touch with the metropolis by rail, but it is just as beautiful and interesting, and has the same main characteristics. Many charming settlements lie close to the coast-line, with beautiful ocean beaches quite handy, and in their vicinity verdant meadows, wooded hills, and tranquil streams.

"Leaving Nowra, the splendid harbor of Jervis bay and the well-known resort of St. George's basin lie within 20 miles. Huskisson, on the shores of Jervis bay, is reached by a branch road—8 miles long—to the left, the main coast road continuing through Tomerong, Wandandian, Conjola, Milton, and thence to Ulladulla, a beautiful sea coast village. In the vicinity are excellent fishing grounds and oyster beds on Lake Burnie and Tobouree Lake.

Hilly to Moruya

"On from Ulladulla the road to Moruya is good, though somewhat hilly; but the scenery is magnificent, the mountain range narrowing in towards the coastline. Nelligen on the Clyde river, under the frowning brows of Sugarloaf mountain, and Bateman, the settlement on the southern shore of the extensive estuary of Bateman's bay, are on this stretch. The roads in the vicinity of these two villages are excellent, and lead to magnificent panoramic views from the neighboring hills.

"From Moruya, the journey continues by a good road to Eden, through the finest stretches of south coast dairy country, great undulant meadows of succulent natural grasses which sustain many famous herds. The first town of interest is Bodalla, the great cheese-making center, and then follow Punkulla, Tilba Tilba and Cobargo—prosperous dairying centers. From Bodalla there is an alternative route to Cobargo, skirting the coast by way of Noorooma and Tilba Tilba, but the better route is the shorter one through Punkulla. From Cobargo, Bermagui, the seaport town is distant 14 miles. Proceeding from Cobargo, on the main route, the next large town is Bega, reached via the small farming centers of Quaama and Brogo. Bega is the largest town met since leaving Sydney with the exception of Wollongong, and is the largest town on the lower south coast. It is essentially a dairy center, and is surrounded by beautiful landscapes. 'Bega,' by the way, is the aboriginal synonym for 'beautiful.'

Famous Whaling Station

"From Bega, the final stretch along the south coast to Eden lies over rather hilly country. There are two routes. The more direct one, lying a little back from the ocean, is through Wolumla and Pambula. By the direct route portion of the road between Wolumla and Pambula is rough. Three miles from Wolumla the turn-off to the left leads to Merimbula, on the coast, through splendid scenery, and, at Pambula, rejoins the direct route than which it is

but 2 miles longer. Eden is a famous whaling station, where the industry has grown to a considerable importance, and the historical relics and quaint buildings of Boyd Town, a link with early days, are worth a visit.

"The ascent of the southern plateau to Cooma may be made in two directions. There is little to choose between them in the matter of road surfaces or grades; but there is a considerable disparity in distance—about 73 miles. The longer route is via Delegate and Bombala, and the ascents of the Tantawanglo and Big Jack mountains; but the shorter and more popular route is through Bega, Bemboka, and Nimitybelle.

"From Bega a good road traverses the magnificent Kameruka estate—one of the finest dairying holdings in the state—to the village of Kameruka. From here the road is hilly, and keeps rising by sharp grades along the stretch to Bemboka, at the foot of the Brown mountain. There now is a striking change of view—wooded hills and deep ravines taking the place of the magnificent stretch of dairy country and delightful pastoral scenes through which the road has passed since leaving Bega.

"From the foot of the mountain to the top is 13 miles, over a most picturesque road, almost every turn in which affords magnificent panoramic outlooks. From Nimitybelle to Cooma the road, which is good, lies over undulating country. Nimitybelle is the second highest town in the state. Half way between there and Cooma is Rock Flat, famous for its natural soda water springs.

Climb Into the Hills

"From Cooma, 2,660 feet altitude, to the Creel, at Thredbo, at the foothills of Kosciusko, the distance is 40 miles over a good road, for the most part undulating; but hilly in places. From the Creel the road follows a circuitous climb of 26 miles round the intervening hills and valleys to the summit of Kosciusko, 7,328 feet, the highest point of the continent. Ten miles above the Creel, at an altitude of over 5,000 feet, stands the Hotel Kosciusko.

"From Cooma the road traverses the broad bosom of the Monaro, and passes through some fine country given over to grazing pursuits. The route passes by Berriedale and Jindabyne, a pretty little hamlet on the banks of the Snowy, 5 miles from the Creel. The Creel is the famous government box for trout fishers, and lies on the banks of the rapid-running Thredbo, and handy to the Snowy and Eucumbene, born in the melting snows of the mountain tops—a trio of fine trout waters, without a peer in the world.

"On the climb from the Creel, many curves in the road at the hilltops command magnificent panoramic views of the river valleys. Ten miles past the Hotel Kosciusko is Bett's camp, and 2 miles further on, at Charlotte's pass, the road rises above the tree line. From the top of the pass the vision takes in the great rounded knolls

of the Kosciusko's range, clad in coarse, grassy tussocks. Kosciusko's giant form rises, with two or three sister peaks—Mounts Mueller, Twynam, and Townsend—of almost equal height, in the heart of the Great Divide. Its remarkably grand, expansive scenery is impressive and memorable.

"On attaining the summit, rough rugged granite crags and their attendant deep, rocky gorges are seen opening at the feet of the visitor; in the center ground the bold outlines of the nearer hills stand clear and firm, while the distant prospect reveals line behind line of tree-covered ranges with radiating spurs, reaching far away and retreating across the Victorian border, through regular gradations of coloring, till the furthestmost is lost in the dim, shimmering haze of delicate blue. In summer the rarefied, exhilarating atmosphere of the mountain giant affords wonderful refreshment and health-giving change to the dweller on the coast and inland plains.

Sport in Winter

"In winter the whole countryside is a vast glistening snowfield, and round about the hotel the ice-covered lake and the ski-running and tobogganing courses are alive with the devotees of these Alpine sports. All materials may be hired at a small charge at the Hotel Kosciusko, a well-appointed hostelry, which offers the same degree of comfort as a first-class city hotel. It is artificially heated throughout, and is quite up to date in every respect.

"In winter the road is kept open to the Hotel Kosciusko, but beyond it the road is completely snowed up. The grandeur of the view from Kosciusko's summit in summer has been mentioned. In winter the beauty and charm of the snowscapes is a magnificent sight, but appeals to different senses. The English snowscape is beautiful; but the Australian bush, with evergreens laden heavily with snow, is an even more wonderful sight. And the glory of the little furze bushes, with their leafy tendrils loaded and crystallized, bending down into the snow in graceful curves, is something to quicken the pulse and fire the imagination."

HURRYING RUBBER SHIPMENTS

New York, Nov. 20—Arrangements are being made for operation of steamers, carrying the Holland flag, from Sumatra and Java direct to the United States, in order to enable consumers of crude rubber in this country to get their supplies of plantation grades more promptly. According to plans now under consideration the first vessel will sail from the far east on December 20.

In carrying out this plan the English government has placed an embargo on the direct shipment of plantation rubber from the far east to the United States in English boats. Accordingly the plan is being worked out for direct shipment to this country in Dutch bottoms which have run heretofore regularly in the trade between the far east and Holland.

War Impressions of a Packard Company Representative

R. N. Goode, Paris Manager, Tells of European Situation

DETROIT, Mich., Nov. 24—"War is something you cannot describe accurately unless you are on the grounds or right near," says R. N. Goode, manager of the Paris branch of the Packard Motor Car Co., who is here on a very brief visit.

"People from outside the countries 'at war cannot get a real conception of what this great struggle now going on among millions of good men in Belgium and France actually is. It is all so tremendously big—the armies, the battle ground, the poor innocent refugees, the whole area involved in the war—that it all staggers you."

Mr. Goode made the trip across the Atlantic on the Baltic, which sailed from England October 31.

"Don't imagine that it was as easy to get away from Paris and reach Folkestone, from where the White Star liner sailed, as under ordinary or normal travel conditions," says Goode. "It was quite a job, both tiresome and quite annoying. To begin with, I had to provide myself with an American passport. Then I had to go to the police commissioner to get his endorsement or permit to leave France. This endorsement is in the shape of a written statement or staying permit, which every foreign resident in France had to secure from the police officials shortly after the war started in order to be permitted to live or remain in France.

Conditions Are Improving

"The general conditions in France and England have greatly improved recently. Business men who left Paris at the time the capital of France was threatened by the Germans are beginning to return and business is picking up. In the south of France everything is about normal and in Nice, Cannes and other famous French winter resort towns the regular winter season will take place. Nice, especially, it seems, will have a big season and, as annually, there will be plenty of foreign visitors.

"Americans will not have to wait until the war is over to do business—big business—in France, in England, in Germany, in fact in most all European countries except Belgium. American manufacturers may secure big business today if they know how and if they know in what lines.

"It seems to me that the American government should assist American manufacturers in directing them how to get the business that awaits them in the countries at war. Most manufacturers do not know what goods are required or needed in Europe nor what the goods are which they may ship and which are not contraband and how they must ship them. The average manufacturer is not posted and it ought to be the government's aim to see to it that every manufacturing concern in the

United States is given an opportunity to get business right now in Europe.

"As far as I am aware, from what I learned before sailing, all merchandise which is not contraband and which is shipped in strictly American vessels will be able to get to its destination. Of course, Great Britain controls the seas and ships will have to submit to British or French inspection, but, if their cargo conforms to the specific rules and regulations issued by Great Britain there need be no fear.

"As far as the motor car business in France and England is concerned all the factories or plants which are in operation are working for only one customer, and that is the government.

"The waste in motor cars is something actually astonishing, in fact, it might be termed criminal. While the British have a perfect system working out splendidly, the organization of the French motor service is lacking in many ways. In fact, there seems to be very little actual organization. The biggest mistake in France is that so many cars are driven by volunteer drivers, by men with good intentions but who know no more about driving or handling cars than about building them. And this does not only apply to the soldiers but also to the officers, many of whom never drove a motor car themselves before the start of the war.

"The reason so many incompetent men drive cars is due to the fact that calls are made for volunteer drivers, and as it is more pleasant to be at the wheel of a motor car than in the trenches, the number of volunteers always is very great. The officers of the army motor service have no time to try out the volunteers, and thus green men often are driving.

"With the British this is practically impossible as in the first place most of the

English drivers are actually driving their own cars, and secondly, they are training a large number of future drivers in Great Britain.

"After the war there will be a market for cars in the countries at war. In Belgium there probably will be no motor car factories standing, as most of that country is said to have been laid in ruins. In France most of the motor car plants are safe thus far, but it will take time to reorganize to get working forces, to get things again going.

"To some extent this applies also to England. Besides it will require time to get the raw material and the finished products needed in the construction of the cars. It will be a long time before the motor industry in some of the European countries again will be in normal running condition.

Packard Ambulances Used

"Five Packard ambulances are in daily service at the front in France. They are the cars used by the Harjes volunteer hospital, which was installed by the American of that name. These five cars have been performing excellently and this is due to the fact that they are driven by competent drivers who know the cars and take good care of them. Another Packard is used at the front to carry messages between the British and Belgian headquarters.

"As for the Belgian refugees, they are coming into France in such large numbers that one wonders if there will be any Belgians remaining in Belgium. They are going to the southern parts, far away from the tragic sound of the cannon and out of sight of their ruined towns and villages. The condition of these poor people is such that collections are made on the trains from among the more fortunate passengers."



PACKARD CAR IN RED CROSS SERVICE CARRYING WOUNDED HIGHLANDERS

Little Change in Manufacturing Conditions in Great Britain

War Activities of Motor Car Makers Described

By Douglas Vickers

LONDON, Nov. 10—There is little if any change in regard to the condition of touring car manufacturers in England, many of them being out of action indefinitely, to use a military phrase. Fortunately some of the larger concerns that were well equipped with automatic machinery have been able to undertake the production of special work for the war department, which will continue until the end of the war.

The completed chassis which the majority of English companies had on hand when the war broke out have been disposed of to the government, many being fitted with armored bodies for scouting work. The Red Cross has absorbed a great many of these.

As an indication of government orders there is the case of the Vulcan Motor Co., which has obtained an order for vehicles and parts to the amount of \$1,000,000 during the past month, which will keep the factories busy for some time. The war business in the commercial vehicle end has greatly helped conditions, and the leading factories now operating for the government are producing approximately seventy chassis per week. Firms not engaged on orders for the British government are working on others for the Belgians and Russians. Only last week the Austin Motor Co. secured a Russian order amounting to \$1,250,000, with an additional order for parts valued at \$250,000.

Big Order for Austin

This order called for forty-eight armored cars, each carrying two machine guns and five men and with a maximum speed of 40 miles per hour; eighteen motor car work shops equipped with lathes, drills, etc., sixteen tank wagons for transporting gasoline; eight spare-parts wagons equipped as traveling stores; 128 ambulances for twelve stretchers each; and 100 transport wagons of the 3-ton type. In addition there was a large equipment of accessories, such as jacks, lighting sets, extra tires, spare parts, etc.

There is much enterprise being shown here by several American makers of trucks. The Peerless company, which had some trucks accompanying the Canadian contingent, is here demonstrating. The Jeffery Quad or four-wheel-drive, is making an impression on the war authorities; the Standard of Detroit is being demonstrated, as is the Fremont-Mais, as well as several others. It was reported here that Wollesley company, one of the largest makers of gasoline trucks in England, has secured the agency for the full line of Baker electrics in this country.

The shortage of horses is becoming a critical factor in England, and already the government has special buying agents through all the South American countries.

This condition is bound to have an effect on the motor vehicle industry in the near future.

Conjecture has it in and around the war office in London that should the war be prolonged over another year or longer there will not be much slackening in the demand for commercial vehicles for field service. Britain's army will be much larger next spring, and at present the Russian army is being handicapped by lack of trucks. Lord Kitchener is at present training an army of 1,000,000 men in different parts of the British Isles. These are to take the field in the spring and their presence in the war zone will call for a great increase in motor equipment. It has just been reported that the Australian government has voted \$1,000,000 for motor equipment to accompany its expeditionary force which is now being prepared.

Many Rumors Current

Many other reports are current in London regarding truck sales, one being that Whittings, Ltd., has secured an order from the Russian government for fifty American Federal trucks.

The present winter already has greatly hampered the use of trucks in Russia, eastern Prussia and Austria.

Non-skid tires are receiving much attention, and now many of the armored cars are being fitted with a tire known as the K. T., which instead of being a continuous band of rubber in made up of rubber studs placed very closely together. Another device extensively used is the Parsons non-skid chain, as well as the Never-Skid device. It has been learned recently that the German government in June had placed a very large order with the English company for Parsons chains, the order to be delivered on telegraph demands. These demands came at the time the war broke out and deliveries were not made.

An interesting aspect of motor transportation in the war is the great number of steam wagons collected from users throughout England. These wagons were largely used in the milling industry and are giving a good account of themselves in the hauling of heavy guns in the war zone. They have been fitted with specially wide tires, making it possible for them to be used in soft fields.

U. S. MOTORS DIRECTORS SUED

New York, Nov. 23—Emanuel Metzgar, a minority stockholder in the old United States Motor Co., which was succeeded by the present Maxwell Motor Co., has filed a suit in the supreme court for New York county, asking that the directors of the old company account for assets which he alleges were wasted during the months prior

to the receivership. Metzger attempted to intervene in the receivership proceedings in the federal court in New York a year or so ago, but was ruled out by the court.

As individual defendants he names James C. Brady, Benjamin Briscoe, Frank Briscoe, Richard Irvin, Herbert Lloyd, Jonathan D. Marwell, Eugene Meyer, Jr., Edgar J. Meyer, Ora J. Mulford, Henry W. Nuckols, Richard A. Robertson, Kenneth B. Schley, Charles G. Stoddard, James W. Stoddard, Carl Tucker and the company itself.

Another echoe of the receivership was heard in the United States district court in New York last week when Harold A. and John C. Howard, trustees of the estate of Sarah J. Howard, secured permission to sue the old Maxwell-Briscoe Motor Co. They demand the balance on a lease of the company's Chicago branch, the lease running until 1929 and payments having ceased in the summer of 1913.

The assets of the United States Motor Co. were sold by the receivers with the permission of the court and were in turn sold to the present Maxwell corporation. The receivers have not yet been discharged, and the United States Motor Corp. and its subsidiaries still exist, in form at least. Under a ruling of the court claimants were required to appear before a certain date or be estopped from collecting, and it was this ruling which had to be modified before the Howards could sue on their lease. Should they recover they may collect under an arrangement made by the court when the Maxwell company bought the assets.

CRESCENT NAMES ITS ASSETS

Cincinnati, O., Nov. 21—Listing liabilities at \$485,590.32 and assets at \$428,968.45, the Crescent Motor Co., bankrupt of this city, recently, through its president, W. T. Hunter, filed its schedule in bankruptcy in the United States district court. The plant of the company is located at Carthage, where it occupies a 10-acre tract.

FRANCE ORDERS MORE TRUCKS

New York, Nov. 23—The French government, which some 6 weeks ago purchased 1,740 motor trucks from four American companies, namely, White, Packard, Pierce-Arrow, and Kelly-Springfield, made another purchase last week from White and Pierce-Arrow. Both orders were practically a duplicate of the previous ones, the White order being for 600 of its 2-ton models. The Pierce order is for 300 5-ton trucks. This last order makes a grand total of 2,640 American trucks sold to date to the French government as the result of the present war.

S. A. E. Committee Deliberates on Standardization

Ignition, Headlight Dimmers and Tires Discussed

NEW YORK, Nov. 19—The 3-days' convention of the standards committee of the Society of Automobile Engineers which closed here today has advanced materially the standards work in preparation for the meeting of the society as a whole during January. There were seventy-six members of the standards committee registered during the 3 days of the convention. During this time the reports of fourteen of the divisions were heard. The meeting also was attended by members of the society not on the standards committee and the discussions were participated in by the committee as a whole.

The topic which was of the utmost interest was that of the single-wire vs. the double-wire systems for use in connection with electric starting and lighting installations. It will be remembered that at the summer meeting at Cape May the society as a whole as well as the standards committee was deadlocked regarding the advisability of advancing the single-wire installation with grounded return as recommended practice. This discussion was taken up again and the results of investigation made by the division showed that more than twice the number of cars that are fitted with the double-wire system will have a grounded return. In view of the large majority of car makers which favored the single-wire system it was felt by the committee that the best method of procedure would be to let events take their course. It was held that practice would reach the same end as standardization as regards the wiring installations of American cars.

Non-Glaring Headlights

Another subject which in view of the wide discussion and legislation is of timely interest is that of non-glaring headlights. The division dealing with this subject has appointed a sub-committee to investigate the opinions of various municipal and state authorities as to what constitutes glare. It was felt that in view of the chaotic difference of opinion which now prevails it would be far more wise to really determine what were the objectionable features of the so-called glaring headlights before attempting to adopt means of eliminating the rather vague quality of glare.

In the opinion of the division there are at present three successful methods of reducing glare. These three methods have been taken from the basic ideas of the various devices which have been presented to the society for testing purposes at the various section meetings and also those which have been widely advertised.

Probably the most prominent of these methods is that in which the light is streamed so that the intensity of the rays is diminished either altogether or in the line of direct vision. Again there is the

method of reducing the amount of illumination by some such means as double bulbs, a resistance in the lighting circuit or series-parallel switches. The third method is that in which the light is deflected without affecting the total number of illuminating units.

It is the intention of this division to work towards a standard method of determining the quantity of glare. It has been reasoned that if it would be possible to standardize a method of measuring the amount of glare upon some standard form of lighting diagram it would be possible to measure all lights according to this diagram and then ultimately to incorporate the legal amount of permissible glare in the laws dealing with this subject. This would give a definite standard to which lamp manufacturers could work and would also tend to form a desirable uniformity in lamp legislation.

Nomenclature of Lamps

Another suggestion of this division is in the nature of the nomenclature of lamp parts. To avoid the confusion which undoubtedly exists between the terms lamp and bulb the division proposes the following definitions:

Bulb—That part of the detachable electric light-giving unit comprised of a filament and its glass envelope and base.

Lamp—The fixture for mounting and utilizing the light of the bulb.

The work of reducing tire sizes also was continued at the meeting. The pleasure-car wheel division submitted a report at the last summer meeting in Cape May in which the number of tire sizes was cut to eight regular sizes. At that time it was suggested that the 36 by 5 size be added to the list, and considerable discussion hinged upon this point. The matter finally was dropped and will be brought up again for discussion at the winter session. The stumbling block that the division has now discovered on this part of the work is whether or not the oversize tires should also be published in the list of standard tire sizes.

It was argued that the ordinary sizes are proper for all ordinary purposes and that the oversize is only required where some exceptional work is anticipated. Some of the members of the committee on this account took the stand that the makers would begin fitting these tires as regular equipment, owing to the fact that they could procure them in quantities almost as cheaply as they could the smaller size, and this would deprive the purchaser of his option of larger tires.

Bad Result Predicted

The bad result of this is that it would force the user to use larger tires than he needed for ordinary work with the resulting poor efficiency in gasoline consumption

and to waste power in driving the heavier wheels without gaining additional benefit from so doing.

The pleasure-car wheels division is going to have something to say in a short time on tire inflations. A standard table of inflations for tires of different sizes will be adopted, and in this table will be given the desirable inflation for all-around work. The table has been compiled and is now under consideration, but will not be acted on at present.

Commercial Car Wheels Debated

Commercial car wheels also were a topic of discussion at the meeting. The principal feature was the necessary thickness of the felloe band to give the required amount of strength without making the wheel too heavy on one side or providing too little bearing surface for the spoke on the other.

A phase of the work of the standards committee which is particularly gratifying is that in which the matter of making the S. A. E. standards jibe with those of other engineering societies is considered. The newly appointed standards exchange committee of the American society for testing materials is considering adopting the Society of Automobile Engineers steel standards as they stand.

It also will be remembered that the Electric Vehicle Association has taken over the S. A. E. standards and the electric vehicle division of the standards committee of the S. A. E. is now working in conjunction with the E. V. A. for standards covering 60-66 and 80-85 volt electric motors.

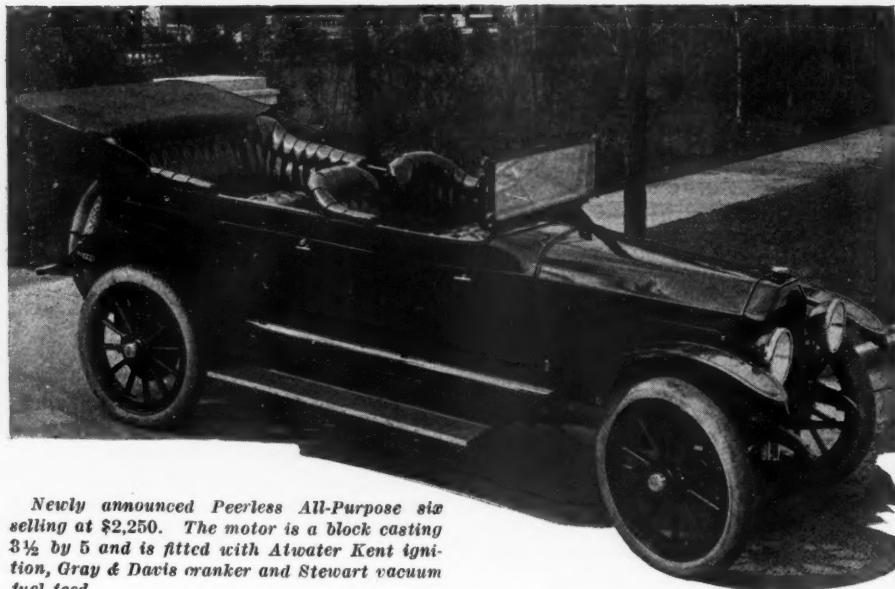
Panama-Pacific Invitation

J. M. Hill of the Panama-Pacific exposition promotion department was present at the meeting to urge the importance of having the S. A. E. adequately represented at the exposition. It will be remembered that at the summer meeting the tendency was towards holdings the convention for next summer in the middle west rather than on the coast, where the attendance would be almost sure to be small.

TO SELL BENHAM PLANT

Detroit, Mich., Nov. 23—The plant of the bankrupt Benham Mfg. Co., at 1882 Mt. Elliott avenue will be sold at public auction December 8 by the Union Trust Co., trustee. The sale will be subject to the confirmation of the district court. The plant consists in reality of three plants, one, a two-story brick and concrete building, 90 by 170 feet, and two two-story frame buildings, 53 by 16 feet and 40 by 93 feet. The main building is equipped with machinery and other equipment for motor car manufacturing purpose, while the small frame building has the machinery and equipment for a woodworking factory. The total value of the plants is estimated at \$50,000.

Peerless Enters Medium-Priced Field With \$2,000 Four Six-Cylinder at \$2,250 Also Featured—Styled All-Purpose Cars



Newly announced Peerless All-Purpose six selling at \$2,250. The motor is a block casting $3\frac{1}{2}$ by 5 and is fitted with Atwater Kent ignition, Gray & Davis cranker and Stewart vacuum fuel feed

THE Peerless Company, which heretofore has built cars of the \$5,000 class only, now has entered the medium-priced field with model 54 lighter four, selling at \$2,000; and model 55, a six, at \$2,250. They are styled all-purpose cars, which is a new appellation to the industry and implies that the design has been carried out with the idea of making them roomy and comfortable for long tours as well as for city work.

Bodies are Interchangeable

Bodies are interchangeable on the two chassis, while mechanically there are no differences except those incident upon the two extra cylinders of the one over the other. The motors follow the same general arrangement and construction, though the bore is slightly different. The six is $3\frac{1}{2}$ by 5 and the four $3\frac{3}{4}$ by 5, and they are block-cast unit power plants of L-head form. Other specifications include left drive and center control, disk clutch, three-speed gearset, open drive shaft of double-universal type with the drive taken through the Peerless platform rear-spring construction. Some of the fittings are Gray and Davis cranking and lighting, Stromberg carbureter, Atwater-Kent ignition, Kellogg single-cylinder, engine-driven tire pump, Stewart vacuum fuel feed and 34 by 4 tires on all models.

Bodies Exceptionally Roomy

Although the bodies are of unusual spaciousness, they are really mounted on short wheelbase chassis. That of the four is 113 inches and of the six, 121. This result has been attained by good design in chassis arrangement, and naturally, the shorter wheelbases tend to less weight. To give some idea of the body spaciousness on these short chassis, the touring body measures 74 inches from dash to front edge

FEATURES OF MEDIUM-PRICED PEERLESS CARS

Six and four similar

Four, $3\frac{3}{4}$ by 5; six, $3\frac{1}{2}$ by 5

L-head block motors

Individual front seats

Four wheelbase 113; six, 121

Bodies interchangeable

Atwater Kent ignition

Gray & Davis cranker

Stewart vacuum feed

Disk clutch and three speeds

of rear seat, and $23\frac{1}{2}$ inches from dash to front seat.

The streamline body form is nicely carried out in the new cars. Starting at the tapered bonnets, the lines widen out gradually and in unbroken smoothness to the rear. The two front passengers have indi-

vidual chairs, between which there is a passageway giving access to the rear compartment. Aside from the sociability of the design, it is pointed out that it aids in ventilating the front compartment and makes it very easy to raise the one-man top.

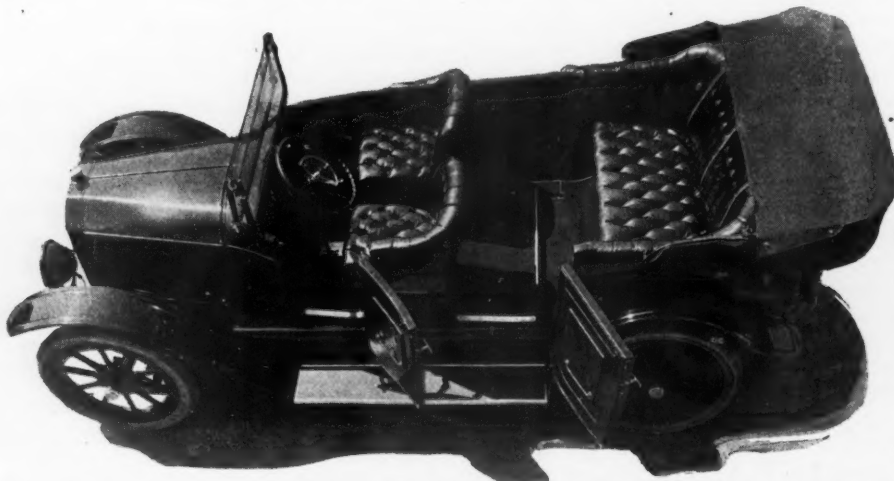
Valve Sizes Different

Other than the differences due to the two additional cylinders, there are only two dimensional items not alike in the two engines. These are the bore and valve diameter. The four has $1\frac{1}{8}$ inch valve diameter and the six, $1\frac{1}{4}$. The four motor develops 38 and the six 50 horsepower, they reaching their highest efficiency at 2,000 r. p. m., which is a piston speed of about 1,666 feet per minute with the stroke of 5 inches. The piston displacement of the six is 288.6 cubic inches, and of the four, 220.92.

The general arrangement of the motors puts most of the external fittings on the right side. Valves are all on this side, as well as the exhaust manifold with individual opening to each cylinder. The generator shaft is here also, it driving a centrifugal water pump on the six, the four having thermo-syphon cooling. On this shaft there is also a gear for driving the single-cylinder Kellogg tire pump.

On the left side there are only two things—the Stromberg carbureter, and the cranking motor which gears to the fly-wheel. There is no external intake manifold, the distribution of the gases to the several intake ports being through cored passages within the cylinder casting. Only a single opening in the center of the block communicates with the carbureter through the intermediary of a short L tube.

On these motors, crankcase and oil pan are separate; the former is an aluminum casting. The latter is made of pressed steel, thus saving several pounds in weight over cast aluminum. All bearings are car-



Peerless \$2,000 All-Purpose four showing the divided front seats and the spaciousness of the compartments. The general design of this car is similar to that of the six

ried in the crankcase and are accessible after the oil pan is removed.

The pistons are cast from the same grade of metal used in the cylinders. Each piston is fitted with three, diagonally-split, eccentric expansion rings. The piston pin is made of special steel tubing, hardened and ground to size. It is held stationary in the piston bosses by means of a locking device, and has its bearing in a large bronze bushing which is pressed into the connecting rod. Ample lubrication is obtained through an opening in the upper end of the connecting rod in which oil from the splash is trapped.

Data on the Bearings

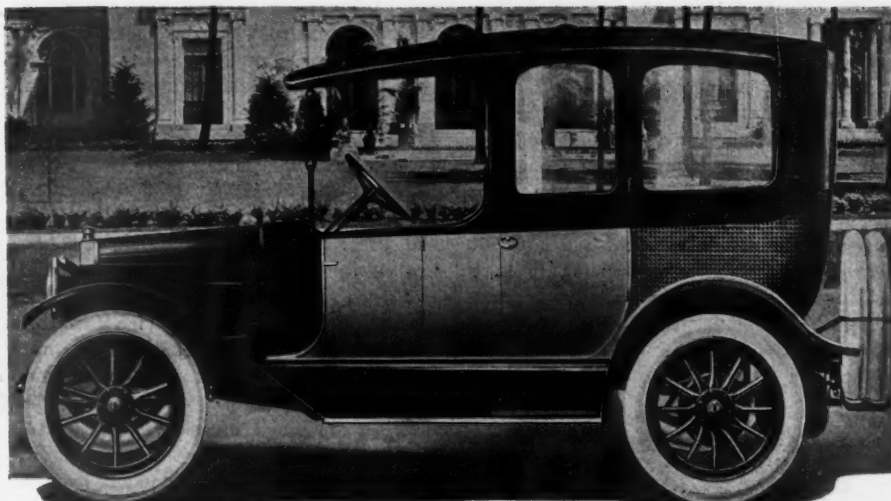
The crankshaft of either motor is of the three-bearing type with liberal-sized bearings. Flanges are provided on both ends of the center bearing to take any end thrust which may be imparted from the clutch or other source.

The camshaft is drop forged from a single piece of low-carbon steel, the cams being integral with the shaft, which runs in three white bronze bearings, lubricated from oil pockets cast in the crankcase for this purpose.

The crankshaft bearings and connecting rod bearings are made of nickel-babbitt, backed with bronze and held in place by brass retaining screws. Bearing adjustment is secured by means of a number of punched sheet steel shims varying in thickness from .002 inch to $\frac{1}{8}$ inch.

Inlet and exhaust valves are interchangeable and have nickel-steel heads electrically welded to carbon-steel stems. The ends of all the valve stems are hardened to insure against wear from the tappet action. The removable metal plates which cover the valves not only keep them free from dirt, but also tend to quiet the motor.

Both the four and six-cylinder motors have a combination forcefeed and splash system of lubrication. A horizontal plunger pump driven by an eccentric on the cam-



Peerless All-Purpose four-cylinder limousine which sells for \$3,100. It is a seven-passenger car and the body is interchangeable with any six-cylinder one

shaft forces oil through copper tubes directly to the timing gears and main bearings. It then drains back into the oil troughs, thus maintaining a level for the splash lubrication of pistons, connecting rods, etc. From the oil troughs it overflows into the oil pan, passes through a filter which removes any foreign particles and is again picked up by the pump.

Timing gears are helically cut and, in order to secure best results, particular attention has been paid to the maintenance of accurate gear centers.

Fuel Feed and Ignition

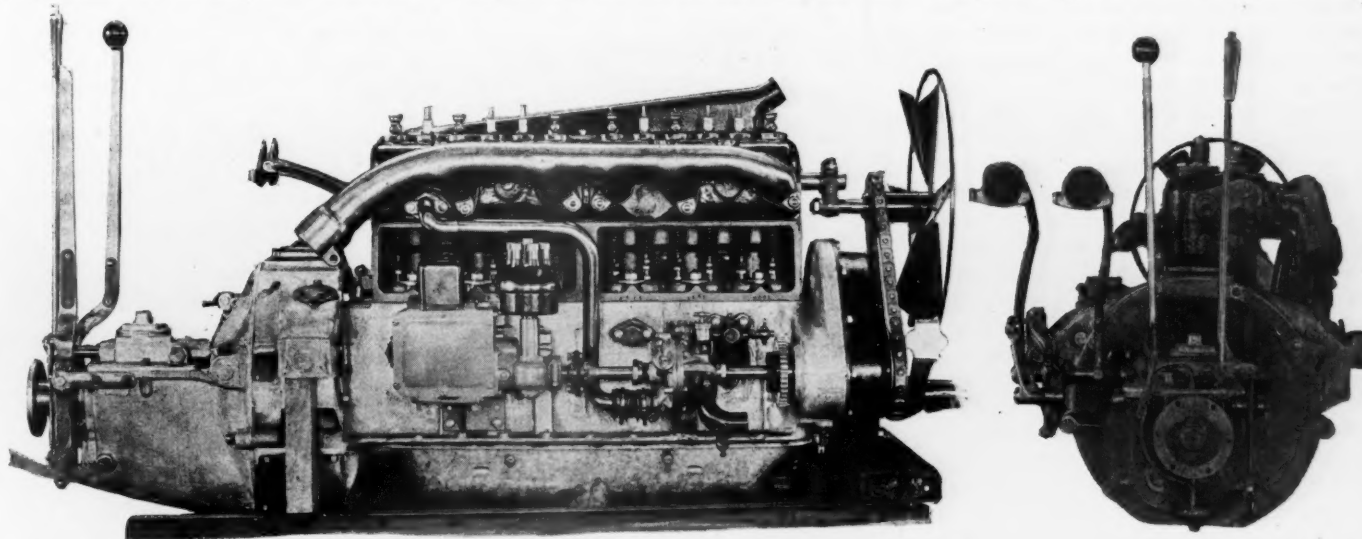
Gasoline is supplied from a 20-gallon tank at rear of car to the carburetor through Stewart vacuum feed system. Ignition is provided by the Atwater Kent Unisarker which receives current at 7.5 volts from dry cells for cold weather starting, and 6 volts from storage battery for regular running. The dash switch is of unique design which automatically provides for frequent reversal in direction of primary current through the interrupter, thus lengthening the life of the contacts. In-

terrupter, distributor and governor providing automatic advance, are combined in a compact unit driven from the shaft of the lighting generator. Open wiring is employed, the high-tension leads to spark plugs being carried on fibre block insulators to insure protection against leakage or grounds.

Details of Lighting System

The lighting system is a single-wire type using Gray & Davis 6-volt generator. The generator is mounted on a bracket at the right side of the motor and is driven through a leather-disk coupling on the gear-driven shaft. The generator also is arranged to carry and drive the igniter unit.

The generator is a variable-speed, shunt-wound type T machine with cutout coil and two-point voltage regulator mounted thereon. The shunt winding of the coil causes the generator to cut into the lamp and battery circuit at 600 r. p. m. Voltage is then regulated against effects of fluctuations in engine speed by means of the two-point regulator which automatically



Power plant of the Peerless All-Purpose six which has a block motor $3\frac{1}{2}$ by 5 cranked by a Gray & Davis motor, fed by Stewart vacuum feed and a Stromberg carburetor and fitted with an Atwater Kent ignition system. The mounting of the generator is shown, and on the same shaft is the ignition distributor. The clutch of this power plant is a disk running dry and the gearset a three-speed. The four-cylinder power plant is not unlike this one in design and fittings, but it is thermo-siphon cooled, while the six uses a centrifugal pump

inserts or cuts out resistance from the two generator shunt field windings. A main cutout acts also as protection for the generator against possible reverse currents from the storage battery.

Head and dash lamps are combined and provided with two bulbs, one of 15 candlepower for country driving and the other of 4 candlepower and out of focus, for city driving. The storage battery is a 6-volt 80-ampere hour Willard, common to both lighting and starting systems and interchangeable on models 54 and 55. Dry cells are provided for emergency ignition.

The Gray & Davis Cranker Installation

The cranking unit is a Gray & Davis type Y, series wound motor, mounted on a bracket at the left side of the engine and driven through a self-contained countershaft and pinion, meshing with a ring gear on the flywheel only when starting. The operation of starting consists in pulling a knob on the instrument board which transmits force through leverage and a helical spring to the sliding pinion on the countershaft. The helical spring causes meshing the instant the pinion begins to turn over.

The electric motor gives a breakaway torque at the crankshaft of approximately 285 foot pounds. It will spin the engine at 125 r. p. m. with a current consumption of 80 amperes.

Clutch and gearset are assembled in a single unit with case bolted directly to motor bell housing. The units are interchangeable on models 54 and 55.

The clutch is of the multiple-disk type and controlled by foot pedal through ball bearing thrust, a special lever design providing easy clutch action and pedal adjustment. Inside clutch plates are $\frac{3}{8}$ -inch stock hardened and ground. Outside plates are cold-rolled steel covered with asbestos friction surface and driven by twelve case hardened keys, riveted to the pressed-steel clutch driving drum.

The gearset is of the sliding, selective type, three speeds forward and one reverse. Other features are Timken roller bearings on mainshaft; S. R. B. ball bearings on countershaft; die-cast babbitt pilot bearing and special ball thrust bearing between front and rear members of the mainshaft.

Universals are provided at both ends of the open propeller shaft. These joints are packed in grease and oil, and are protected from leakage and dust by sheet metal boots. The propeller shaft is integral with the universal member at the rear axle end, while at the gearcase end it has a fluted sliding joint, thus providing for movement of the rear axle on rough roads. The propeller shaft center is of steel tubing.

The rear axle is of semi-floating type, with the main housing of reinforced pressed steel with pressed-steel rear cover. The differential and pinion shaft form a unit with the front cover, thus insuring alignment, yet giving commendable accessibility. The pinion shaft and differential

are each carried on two taper-roller bearings which care for both the radial and thrust loads. Rear axle gears are of the spiral-bevel type which insures quiet running. Axle shafts are provided with single taper roller bearings near the outer ends to take the wheel load.

There are the usual two sets of hub brakes. The foot or service brakes are of the contracting band type, while hand brakes are of the expanding shoe type. Both are provided with asbestos friction lining. Adjustment of service brakes is made simple through the use of wing nuts.

Platform type of rear spring suspension, which has been featured on former Peerless cars, is continued on models 54 and 55. Lightness and simplicity of chassis are furthered in these smaller models by eliminating radius rods and using the rear side springs to take the drive. They also take the torque reaction, thus permitting the omission of a separate torque member.

ADDITIONS TO URBAN LINE

The Kentucky Wagon Mfg. Co., Inc., Louisville, Ky., announces two new models for 1915 in addition to their regular line of Urban electric trucks. The new models are worm driven and are a 1-ton electric at \$2,000 and a $1\frac{1}{2}$ -ton gasoline at the same price. To distinguish them from and to prevent confusion in ordering repair parts, the worm drive models are to be known by the trade name Old Hickory, which has been used by the Kentucky Wagon Mfg. Co. on their other products since 1879.

The electric 1-ton model 20 W is fitted with a battery of capacity to drive the machine 40 to 45 miles to a charge. The battery is carried on a steel sub-frame on each side and by removing the side covers all battery cells are accessible. The electric motor is suspended well forward between the battery compartments and is connected by propeller shaft with two universals to the worm-drive axle. The controller giving the various speeds forward and reverse is under the seat connected directly to the control lever and is readily

accessible by removing the seat panel. The balance of the space under the seat may be used for extra battery in case more mileage per charge is desired.

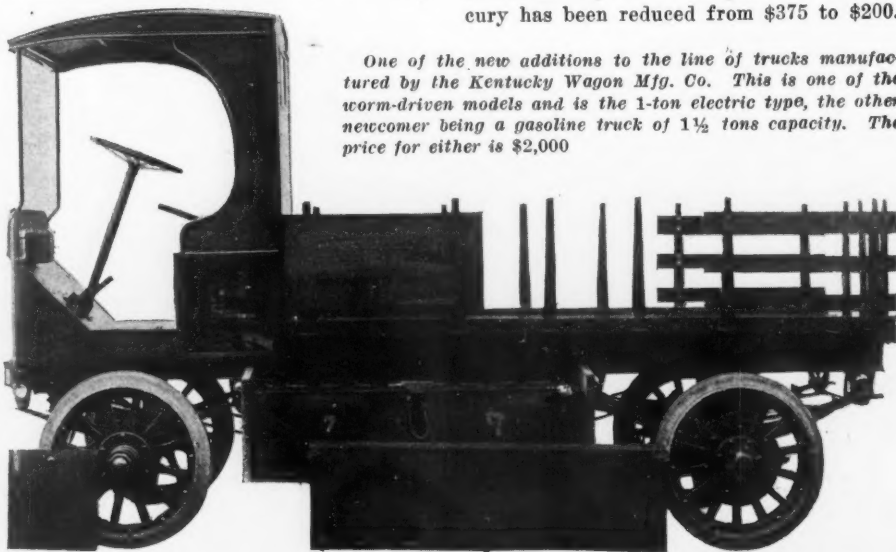
The $1\frac{1}{2}$ -ton gasoline model 30 W is powered by a Continental four-cylinder motor with cone clutch and gearset in unit. It is equipped with both battery and magneto ignition, the Heinze dual system being used. The steering wheel is on the left side on both models with control lever on the electric car and gear shift lever on the gas car at the left hand. This uniform control for both models is a considerable advantage where a business house using electric cars for city and gasoline cars for suburban delivery desires to shift drivers from one route to the other.

RED CROSS SUIT DECISION

Milwaukee, Wis., Nov. 23—The wholesale suits brought by the United States district attorney at Milwaukee against corporations, municipalities, physicians and other individuals for illegal use of the insignia of the Red Cross Society, in all probability will end in a puff of smoke. The city of Milwaukee, charged with using the Red Cross illegally on its ambulances, health department vehicles and badges of health officers, has secured a dismissal of its case on the plea that it does not use the insignia for advertising purposes. Federal Judge Geiger declared: "In my judgment the city is in no sense engaged in the use of this emblem for purposes of trade or as an advertisement to induce trade. The city is exercising a delegated sovereign function of the state of Wisconsin in respect to the health of its citizens. Public officials who wear an insignia of their office cannot be said to advertise their positions." A dozen more cases await final action.

MERCURY COMPANY SOLD

Detroit, Mich., Nov. 23—The Mercury Cyclecar Co., of Detroit, has been purchased by the Michigan State Auto School, also of Detroit, which will continue to build Mercury cars. The price of the Mercury has been reduced from \$375 to \$200.



One of the new additions to the line of trucks manufactured by the Kentucky Wagon Mfg. Co. This is one of the worm-driven models and is the 1-ton electric type, the other newcomer being a gasoline truck of $1\frac{1}{2}$ tons capacity. The price for either is \$2,000

Grant at \$795 Lowest-Priced Six-Cylinder in America

Price Without Electric Equipment \$750—Motor 2 7-8 by 4

FOR some time there have been rumors of several low-priced six-cylinder cars of low weight to be placed on the market. That there is one at least is made certain by the appearance of the new Grant six from the factory of the Grant Motor Car Co., Findlay, Ohio. This concern concentrated last year on a four-cylinder car and comes to the front for the 1915 season with a six-cylinder, the smallest of any six so far produced in America.

This is a 30-horsepower six weighing less than many fours, carrying five passengers, provided with electric lighting, starting and such other features of equipment as one-man top at \$795, the lowest price of any six-cylinder car so far produced. Tread is standard, of course, with a 60-inch offered for southern trade. The wheelbase is 106 inches and tires 30 by 3½ on wood wheels.

Motor Has Overhead Valves

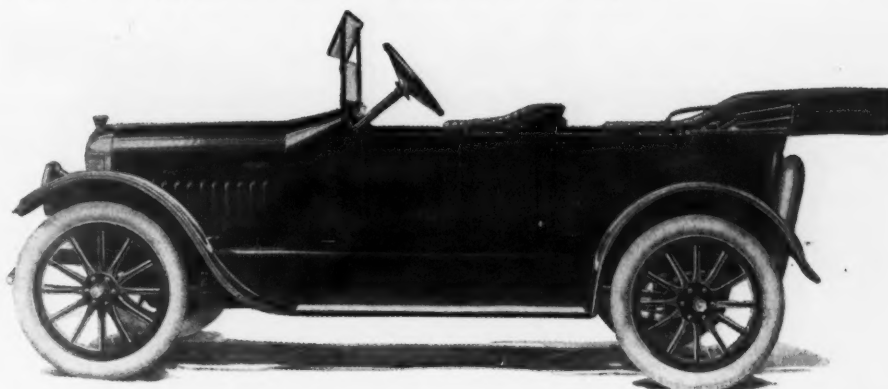
The new Grant six has a motor of 2⅞-inch bore and 4 inches stroke. It is essentially a high-speed high-efficiency motor, the special effort having been made to obtain a maximum power from each explosion in the cylinder, and thus maximum efficiency and fuel economy. To this end the overhead-valve construction has been adopted, but the valves have been concealed and noise subdued by a covering plate which produces an exceptionally clean and compact-appearing engine. The cylinders are cast in a single block, are water-cooled and, together with the gearset and clutch, is suspended by three points.

Ignition is obtained through the Atwater Kent System which has a feature of automatic spark advance. Electric lighting and starting is provided by a motor-generator mounted on the engine. Lubrication is by means of a constant-level circulating system with a sight feed on the cowl board. The fuel supply is by gravity, the tank being mounted on the dash under the cowl with a filler cap in the cowl board.

Nothing Radical in Running Gear

Power is carried from the motor through an adjustable cone clutch to a three-speed selective gearset, in which the shafts are carried on annular ball bearings. The rear axle is of the floating type with differential and pinions on one carrier, fully adjustable. The axle shafts and gears are mounted on ball and roller bearings and an inspection plate is provided at the rear for differential adjustments. Steering is by an irreversible worm and sector type post located on the left side and center gearset and emergency brake control are fitted. The brakes are internal and external, acting on the rear wheels. The rear springs are of the cantilever type while the front ones are conventional semi-elliptics.

The body is a distinctively streamline



The new Grant six-cylinder, five-passenger car selling at \$795 with electric cranking and lighting equipment and at \$750 without it. The motor is 2⅞ by 4 cast in block and drives through a cone clutch and three-speed gearbox. The wheelbase is 106 inches

type with deep, wide, tilted cushions, the fenders are heavy stamped crowns. Wood-en wheels are used with Q. D. demountable rims, carrying 30 by 3½ straight-side tires. The windshield is a two piece rain-vision type adjustable to any position and to it attaches the forward part of the one-man top. The cowl board carries oil-pressure gauge, speedometer, ignition switch, and gasoline filler. The other equipment consists of electric horn, robe and foot rails, extra demountable rim, which is carried at the rear, and two-bulb headlight for city or country driving.

At the price of \$795 the car is supplied with electric lighting and starting but an option is given by which the car may be obtained for \$750 without the electric equipment, in which case a Prest-O-Lite tank is supplied for the headlights.

The Motorists' Bookman

The Book of Detroiters

THE Book of Detroiters, edited by Albert Nelson Marquis and published by A. N. Marquis & Co., Chicago, is a "Who's Who" of the Michigan metropolis, a biographical dictionary of the prominent living men of the city that Cadillac founded and the barons of the motor car industry developed. A volume of approximately 550 pages and containing the biographies of about 2,500 Detroit citizens, the Book of Detroiters should be especially valuable as a work of reference for newspaper and business men.

The Southland of North America

"The one and only broad highway of Central America is the water that bounds it. There are no inter-republic roads, few wagon roads worth mentioning and none worth traveling, except as a last resort." In writing this, the author of "The

Southland of North America," George Palmer Putnam, might be construed as warning the motorist from invading Central America, but if such are his intentions, he defeats his purpose by describing his travels so delightfully, so intimately that the reader becomes obsessed with a desire to visit the republics to the south. The book is exceptionally entertaining and there is a laugh on many of the pages. It is illustrated from photographs and published by G. P. Putnam's Sons, New York. The price is \$2.50 net.

The Tourist's California

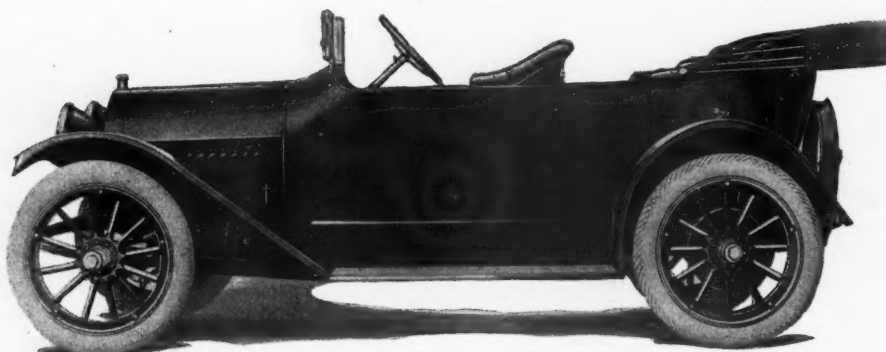
The motorist planning a visit to the expositions to be held in San Francisco and San Diego next year should find the hours given over to the perusal of this book time profitably spent, as "The Tourist's California," by Ruth Kedzie Wood, is an exceedingly instructive guide book. There is a chapter of general information, covering such subjects as transportation by rail and water, scenic motoring routes, language and names and climate and seasons, following by chapters on hotels and restaurants, sports, theaters and festivals, mountain climbing and motoring, and descriptive of the most historic and picturesque places. There is an appendix which gives the tourist cities and resorts of California. The book is illustrated from photographs and is from the press of Dodd, Mead & Co., New York.

American Tool Making

A book intended primarily for tool-makers but which the present-day garage-man will be interested in, is "American Tool Making and Interchangeable Manufacture," by Joseph V. Woodworth. The presswork was done by the Norman W. Henley Publishing Co., New York, and the price is \$4. The treatise is intended for the engineer in charge of the shop as well as the man working at the machine; for the draftsman and in fact all who are interested in metals and metal working. Illustrations are many and clear, all of them being line drawings.

Chevrolet Reduces Price of the Six-Cylinder to \$1,425

Five-Passenger Four at \$875—Bodies Redesigned



The 1915 Chevrolet Baby Grand, a four-cylinder, five-passenger model selling for \$875. It has a new body and is equipped with an overhead-valve motor. The wheelbase of this car now is 106 instead of 104 inches

CCHEVROLET is in the ranks with two chassis—a four and a six. The former carries either roadster or touring body, while only the touring type is fitted to the six-cylinder chassis. With roadster body, and styled the Royal Mail, the four is priced at \$750, while with five-passenger body it sells for \$875 and is known as the Baby Grand. The six is offered at \$1,425, which is \$50 less than last season.

With practically no mechanical change, the body of the six is redesigned and streamlined so as to be roomier than it was. In the four-cylinder chassis the wheelbase has been lengthened 2 inches to 106 inches, and the brakes have been made more powerful by an increase in diameter from 10 to 12 inches.

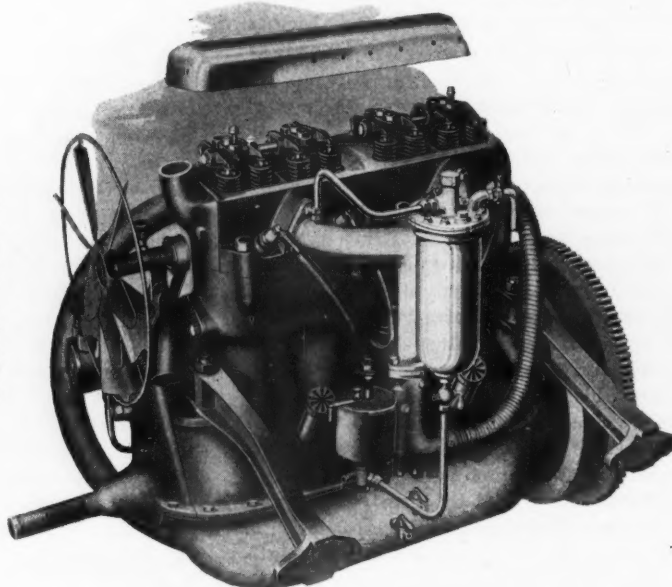
Summarizing the Car Features

The six-cylinder motor is an L-head $3\frac{1}{8}$ by $5\frac{1}{4}$, with cylinders in blocks of three. Thermo-syphon cooling, constant level splash oiling, and Remy dual ignition are features of this power plant. The drive shaft is inclosed in a torsion tube, bolting at its rear end to the gearbox, the latter being in unit with the rear axle, which is three-quarter floating. Other specifications include cone clutch, platform rear spring suspension, left drive, center control and rear gasoline tank feeding by pressure. The wheelbase of the six is 112 inches, tires are 34 by 4 and Auto-Lite cranking and lighting are furnished at the price.

The fours have the distinctive Chevrolet $3\frac{1}{8}$ by 4 motor with valves in the head, rockers and springs inclosed within an aluminum cover plate. The cylinder head is a one-piece casting secured to the cylinder block by bolts, making a compact and readily-removable assembly.

Drive is through a cone clutch to a three-speed gearset, located amidships on two frame cross members. Final drive is of the double-universal uninclosed shaft type, torque being taken by a rod and drive by the rear springs, which are three-quarter elliptic. Tires are 32 by $3\frac{1}{2}$ on both roadster and touring car. The four-cylinder

Motor of the four-cylinder Chevrolet, which is $3\frac{1}{8}$ by 4. Note the location of the valves in the head and the position of the Stewart vacuum feed tank on the inlet manifold. The entire cylinder head of this engine may be removed easily



FEATURES OF THE CHEV-ROLET LINE FOR 1915

*Two cars, a four and a six
Six, price \$1,425 instead of \$1,475*

Four wheelbase increased 2 inches to 106

Brakes on four are larger by 2 inches

Four has valve-in-the-head motor

Six uses an L-head

Stewart vacuum feed on four

New streamline bodies

Few mechanical changes

prices named do not include Auto-Lite electric cranking and lighting. When equipped with it the price is \$110 extra. Five lamps and Prest-O-Lite tank are furnished at the above figures, however.

The valve-in-head-type of engine which propels the four-cylinder roadster and

touring car has a displacement of 170.9 cu. in., its stroke-bore ratio is 1.08 and S. A. E. horsepower rating of 21.8.

The cylinders are cast in block, with the upper half of the crankcase integral with them. The joint at the base of the cylinders is thus eliminated, resistance load being spanned to the crankcase walls and bearings through continuous webs placed so as to distribute the strain, which is reduced on each cylinder individually because of the support given by the adjoining cylinder.

The head is a one-piece casting secured to the cylinder block by bolts, the joint being made with a copper and asbestos gasket. The special advantage of the

separate head construction is that, being readily removable, access to valves and combustion chambers is an easy matter. The valves are carried in the head piece without cages, which allows efficient cooling of both valves and their stems, they being entirely surrounded by water. The plugs also are set at a convenient angle in the head casting on the right side.

Engine Has Neat Appearance

A compact and neat appearance is given the engine assembly, due to the housing in of the rockers and springs within an aluminum cover plate fitting to the cylinder head and being held in place by a bolt at either end. Besides keeping out dirt, this also has the effect of silencing the valves. When the cover is in place, only valve rods, running down to the tappets on the right side, are visible.

The engine is not of the unit power plant type, but has exposed flywheel with gearbox separately mounted further back. The motor supports are at front and rear of the cylinder casting, and are in the form of arches from which the assembly is hung by

bolts. These arched arms attach to the side frame rails.

The carbureter is a 1-inch Zenith, utilizing heated air taken from a jacket on the exhaust manifold and conveyed through a flexible tube to the air intake. A shelf on the right carries the Simms high-tension magneto, which is driven by a shaft connecting to the camshaft drive through helical gearing housed at the front of the motor.

On the touring model only, the gasoline tank is placed at the rear of the chassis, and instead of having pressure feed to the carbureter, the Stewart vacuum feed system is employed. The vacuum tank is mounted on the vertical portion of the intake manifold so that its feed to the carbureter is almost vertically downward. On the roadster model, this vacuum supply is not required, as a positive gravity feed is attained by placing the main supply tank on the rear deck, it being high enough above the carbureter to insure a good flow.

Internally, the Chevrolet four-cylinder motor presents no unusual features but adheres to approved design. The crankshaft is a three-bearing type running on die-cast babbit bearings with the center one brass backed. The connecting rod bearings are also brass backed, and are drop forgings with strap ends.

Motor's Interior Construction

The cooling system is of the thermo-siphon type and lubrication system a self-contained, constant level splash. Oil is circulated by a gear pump, which takes the supply from the lowest part of the crankcase and after forcing it through the dash sight feed, sends it back to a distributing pipe inclosed within the crankcase. This distributor delivers the oil to the individual oil troughs, into which the connecting rod ends dip at each stroke. All bearings have oil grooves, while the crankshaft bearings are supplied from pockets in the crankcase casting above the bearings. These pockets receive their oil from the splash action. The camshaft bearings are oiled by wicking from the crankshaft bearing pockets just referred to.

The Auto-Lite cranking and lighting system, which is supplied at extra cost, is of the two-unit type, an electric motor connecting through the Bendix drive with teeth in the flywheel rim serving for turning the crankshaft and a separate generator driven by helical gearing and carried on the right, providing current for lighting and ignition. The latter has in unit with it a Connecticut coil and distributor to take care of the ignition, it replacing the magneto equipment when the electrical system is supplied. The storage battery used is a Willard and the headlights are of the two-bulb form, eliminating dash lamps. The cranking motor, when fitted, occupies a position to the right of the flywheel, being hung from a frame cross arm.

The drive features include a cone clutch and gearset carried amidships on two frame cross members. It gives the cus-

tomary three forward speeds and reverse. The main shaft is carried on annular ball bearings, while the counter shaft revolves on plain bronze bearings. The gearshift lever is placed directly above.

The propeller shaft is of the open type, fitted with two universals, with the torque taken by a torque arm and drive by the leaves of the rear springs. The rear axle presents a strong appearance and is of semi-floating construction with its shafts running on Hyatt roller bearings. The housing is of malleable iron, and is split crosswise. The gear ratio is 4 to 1. The outer ends of the axle tubes carry the brake shafts operating the internal expanding emergency and external contracting service brakes, which act upon 12-inch drums that are 1¾-inch wide.

The equipment of both roadster and touring car includes everything now looked upon as standard.

Six Unlike the Four

There is very little in common between the chassis design of the six and the fours already described. The motor with its dimensions of 3½ by 5¼ delivers 26.3 horsepower by S. A. E. formula, has a displacement of 271.5 cubic inches, and its stroke-bore ratio is 1.58. The cylinders are cast in blocks of three of L-head type, valves being on the right. The crankcase is of the two-part, horizontally-split design with the cylinder blocks bolting to the upper half of the case. This engine has the same method of support in the frame as the four. Arranged on the right side are the exhaust manifold and the three electrical units for ignition, cranking and lighting, crankcase brackets carrying them. A Zenith double-jet, horizontal carbureter is placed on the opposite side, there being little or no external intake manifold, connection is to the adjacent corners of the cylinder blocks providing entrance to the passages within the castings.

The cooling is by thermo-siphon. Oiling is of the constant level splash arrangement with circulating maintained by a plunger pump, operated by a camshaft eccentric. The oil reservoir is an integral part of the lower half of the crankcase, on the right rear side.

Like the four, the main bearings of the crankshaft which are three in number, and the connecting rod bearings are of die

cast babbit and brass backed. The camshaft, a drop forging with integral cams, has three plain bearings and is operated by helical gear connection with the crankshaft.

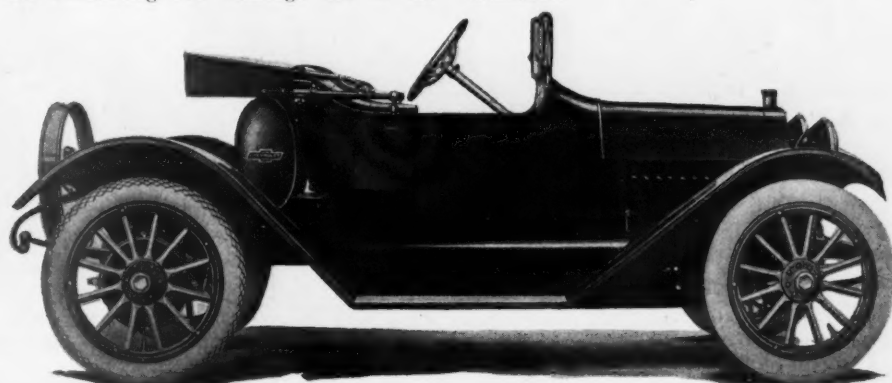
The shaft on the right, which is also driven by helical gears, drives the Auto-Lite generator, and back of it the Remy dual magneto, through universal connection. The cranking motor, also an Auto-Lite, is mounted so that its gears will shift into mesh with the flywheel face teeth when the pedal is pressed. This pedal not only makes the gear connection but sends the current to the motor. The storage battery is a 6-volt Willard. This electrical equipment comes at the list price, as already pointed out.

The final drive after it leaves the cone clutch is through a propeller shaft inclosed within a torsion tube. In this construction, only one universal is used, that being ahead of the point where the shaft enters the tube. This tube takes both drive and torque, and is braced by radius rods running from its front end diagonally out to the ends of the axle tubes.

The gearbox is a part of the final drive unit, being interposed between the end of the tube and the axle housing, flanges connecting all three to make a unit. This gearset has three selective speeds and reverse. The axle is three-quarter floating.

NEBRASKA AFTER A COMMISSION

Omaha, Neb., Nov. 21—At the annual session of the State Automobile Association of Nebraska, on November 17, the association agreed to extend efforts toward obtaining a highway commission for this state. A. G. Batchelder, chairman of the A. A. A. executive board, who was present, declared Nebraska might be ignored in the appropriation for improving roads and highways to be passed upon by congress, if a highway commission plan is not adopted. Nebraska is one of nine states which have not yet adopted the plan. The meeting also elected officers for the ensuing year. They are: Harry Lawrie of Omaha, re-elected president of the organization; Brooks of Stanton and Smith of Tecumseh, first and second vice-presidents, respectively; Dr. Overgard of Fremont, secretary, and M. R. Schiek of Beatrice, treasurer.



Chevrolet Royal Mail, the two-passenger model of the four-cylinder. It sells for \$750, and at extra cost is fitted with an Auto-Lite electric system

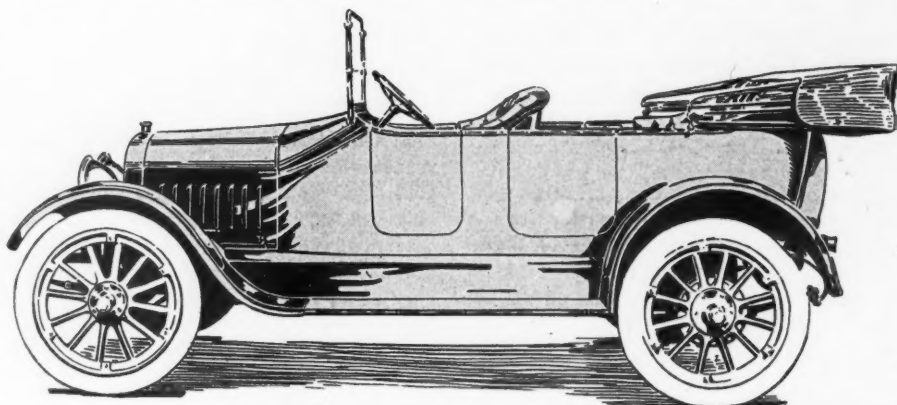
New \$1,000 Inter-State Four Has Gearset on Rear Axle

Muncie Car Uses Distinctive Overhead-Valve Motor 3 1-2 by 5

THE Inter-State Motor Co., Muncie, Ind., which, in February of this year, purchased the Inter-State Automobile Co.'s assets and plant, announces for 1915 a new \$1,000 four-cylinder, five-passenger car with a 110-inch wheelbase and equipped with a distinctive valve-in-the-head motor, cone clutch and three-speed rear axle gearset. At the price named, the car is fitted with the Remy cranking and lighting system and the regular standard appurtenances.

Many Motor Features

As a feature, the motor ranks first. Its dimensions, 3½ by 5, put in the long-stroke class and because of its valves being placed directly in the head unusual horsepower figures have been obtained. It is claimed that at 1,600 r.p.m. the engine develops 36.4 horsepower. The four cylinders are cast in block with the upper half of the crankcase. This forms one of three units, the other two being the cylinder head, which carries the valves and manifolds, and the crankcase lower half. The head is held in place by eight bolts and nuts and when removed gives access to the pistons, cylinders and valves, as shown in the illustration herewith. The valve operation is obtained by vertical push rods all on the left side, and rocker arms, but the entire valve mechanism, with the exception of the rods, is inclosed in a neat aluminum housing, as illustrated in the assembled motor view herewith. Another feature of the Inter-State engine is that the pistons may be removed either through the top or bottom of the motor. On the whole, the engine seems to have been designed with accessibility of the



The new Inter-State four, a product of the Inter-State Motor Co., Muncie, Ind., which purchased the plant of the Inter-State Automobile Co. This car has a 110-inch wheelbase and is listed at \$1,000. Its features are an overhead valve motor and rear axle gearset

FEATURES OF THE NEW \$1,000 INTER-STATE

Valve-in-the-head motor 3½
by 5

All valves in removable head,
operated by rocker arms

Rear axle three-speed gearset
Remy cranking, lighting, ignition

Bottle-neck frame

Five-passenger model only

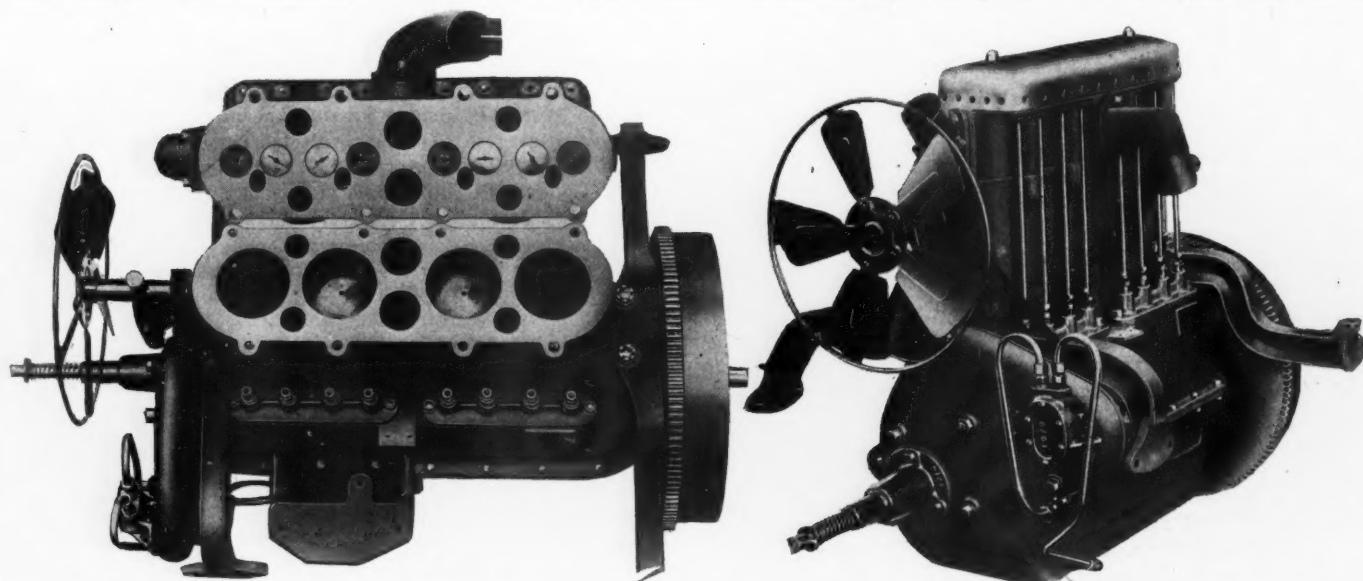
Wheelbase 110 inches, tires 33
by 4

internal parts, in mind, so that the owner will be in a position to do the repairing of minor parts himself. Carbon scraping,

for example, requires only the removal of the cylinder head. Cooling is by thermosiphon system with large-diameter inlet and exhaust and suspension by four points. These are formed by brackets held by two bolts, to the crankcase. The arms and method of attachment are shown in the left illustration on this page.

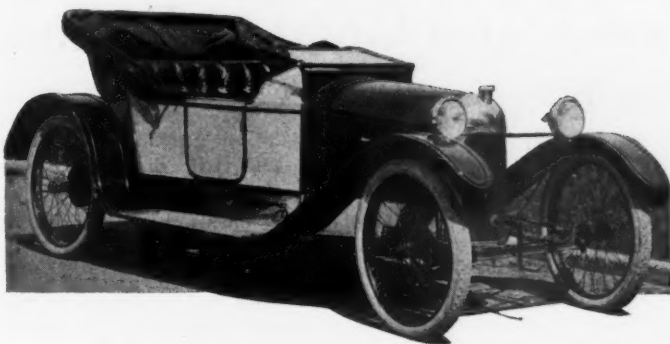
Spark Plug Points Between Valves

The carburetor is located on the right side and feeds through a two-arm manifold to the cylinder head, which is cored out. On the same side are the spark plugs, which are screwed into the casting at an angle so that the plug end falls between two valves. The openings between the valves in the left illustration on this page are spark plug holes. These plugs are fed from a Remy combination generator and distributor on the opposite side, the wires being carried over the cylinder head cover,



The left illustration shows the cylinder head of the Inter-State four motor removed. This construction makes it a simple matter to clean carbon from the cylinders and pistons. The latter may be removed either through the top or bottom of the motor. The valves are shown in a row and between each two is a spark plug

The illustration at the right shows the assembled motor. Note the unusually high cylinder head. This is made so because the head carries the intake and exhaust passages and the short manifolds. The valve mechanism is under the aluminum cover and is in the form of rocker arms operated by the vertical push rods



Greyhound roadster which is mounted on an oddly-constructed chassis which has a short frame and cantilever springs extending to the rear axle housing as shown in the chassis view herewith

but are protected by a flexible conduit. On the left side also is the Remy cranking unit, which turns the engine over through flywheel teeth. The exhaust manifold for this engine is unusually short and is seen in the illustration at the right, held to the cylinder head by two bolts.

The clutch is a cone and drives by inclosed propeller shaft to a rear axle gearset of the three-speed type. The axle is a floating.

The frame to which these units are at-

tached is shaped like a bottle with the neck portion up front and supporting the engine. It flares out slightly ahead of the dash and appears wide enough at the rear to accommodate a roomy body. The complete car has an appearance not unlike many others with a streamline type of body. The cowl is rather long and meets the hoods without an abrupt break. Clean body design is evident from a glance at the view of the car shown on the opposite page.

Odd Suspension on 1915 Greyhound

Two Models with Different Treads

THE State Motor Car Co., Toledo, O., announces for 1915 two Greyhound cars, model H with 44-inch tread and 104-inch wheelbase, and model I, standard tread and 106-inch wheelbase. The motors are alike with the exception of the dimensions which in the model H are $2\frac{1}{2}$ by 4 and the other $2\frac{3}{4}$ by 4.

Frame and spring suspension are featured on the Greyhound. Instead of having a frame which extends from front to rear axle, one is used which occupies approximately four-fifths of the distance as shown in an illustration herewith. From the rear end of the frame connection to the axle is by reverse quarter-elliptic springs, the same method being used in front with smaller springs. This construction brings the frame very low and allows of the motor being set high and driving by a straight line shaft to a gearset. The latter is located almost on a line with the end of the frame at the rear and drives

by a short shaft, of small angularity, to the rear axle.

The motor, a four-cylinder, is of L-head construction, thermo-syphon cooled, fitted with Remy single magneto and at extra cost a Westinghouse cranker. This engine drives a cone clutch from which the power is transferred by single-universal shaft to a two-speed gearset. Another shaft takes the power to a bevel-gear type axle. Wheels are wire 28 by 3 and the drive left with control in the center. Either tandem, side-by-side, coupe or delivery bodies are fitted.

FIGHT IN NEW YORK STATE

Poughkeepsie, N. Y., Nov. 19—The annual convention of the New York State Automobile Association which closed here tonight was the scene of a factional fight between the present association organization, headed by President A. J. Deer, Hornell, and the Rochester and Buffalo clubs, which endeavored to prevent Deer being

chosen for a fourth term and also attempted to have the by-laws amended. They were checked in all their moves and the larger part of the two big club delegations left before the convention ended.

It is stated that there is a strong possibility that Rochester, Buffalo and Syracuse will form an independent organization and ask recognition from the A. A. A. If formed it would have about 10,000 members and would be about equal in strength to the regular organization. The matter is to be taken up at the next meeting of the respective clubs.

The contest, aside from being Deer and anti-Deer, was, in sentiment, between the big clubs and the small clubs.

Highway Commissioner John N. Carlisle injected an element of surprise when he suggested that there be a reciprocal arrangement between New York, New Jersey, Massachusetts and Connecticut, whereby foreign tourists pay a tax of 4 cents a gallon on gasoline for good roads maintenance. Sanitary Supervisor Paul V. Winslow, of Wappinger Falls, suggested that the association cooperate with the state in sanitary work about hotels and other public places.

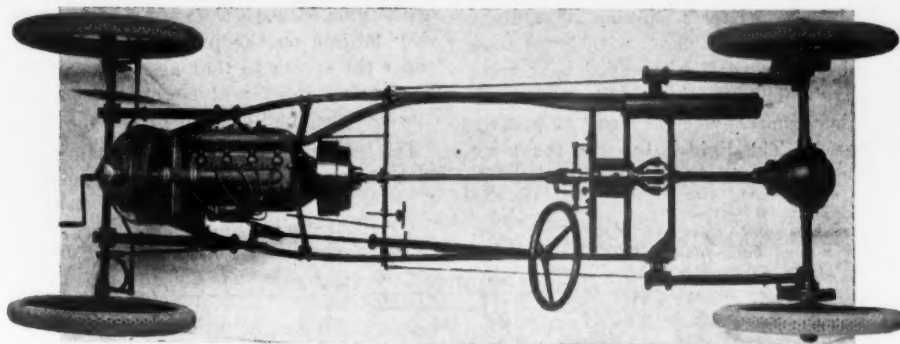
General Counsel Melvin Bender reported on bills which had been throttled during the year and urged the passage of a wheel tax. The convention named a committee to take up long detours because of closed roads. Leaving half the road passable was urged.

The treasury contains \$2,468.67 but there are unpaid vouchers of \$3,205.85, a deficit of \$737.18. The association now has seventy-five clubs, a gain of thirteen, and 17,516 members, a gain of 2,995. The secretary advised as reforms to work for: Uniform ordinances, good roads work, a wheel tax, making failure to carry lights a misdemeanor and more active clubs. The officers chosen are:

President, A. J. Deer, Hornell; first vice-president, Frank M. Backus, Troy, re-elected; second vice-president, John M. Ross, Utica, re-elected; third vice-president, Herbert G. Andrews, Brooklyn; treasurer, Fay C. Parsons, Albany; delegates at large, Frank Emsell, Watertown; F. C. Tallman, Auburn; Dr. George C. Lempe, Albany; executive member at large, Peter H. Troy, Poughkeepsie.

TO AMEND LOZIER PETITION

Detroit, Mich., Nov. 24—Special telegram—United States District Judge Tuttle yesterday granted permission to three creditors of the Lozier Motor Co. to amend their petition to the court to include the charge of bankruptcy. Because the company is unable to pay its debts at a meeting of directors of the company a special committee consisting of J. M. Gilbert, and E. D. Stair, Detroit, and E. P. Earl, New York, was appointed to confer with eastern creditors holding claims for about \$1,000,000 to further discuss plans for reorganization and avoid legally if possible the Lozier company being declared a bankrupt on the grounds that the company is unable to pay its debts. The hearing of the creditors has been set by the court for December 1.



Chassis view of the Greyhound showing the short frame and method of attaching springs from it to the axles. Note the two-speed gearset mounted on the cross members at the frame rear. The motor is a four of either $2\frac{1}{2}$ by 4 or $2\frac{3}{4}$ by 4

Weight and Tread-Wheelbase Ratio Comfort Factors

Engineer States These Two Form Basis of Easy-Riding Car

By William B. Stout

Chief Engineer Scripps-Booth Co., Detroit

THERE are two important principles which form the basis of comfort-efficiency in car design. The one definitely governs the physical effect of road bumps on the passenger; the other determines the ability of the car to hold to the road at speed or in rough places. The first is the much-discussed principle of minimum unsprung weight; the second the tread-to-wheelbase ratio.

Fig. 1 indicates the basic principle of unsprung weight. Suppose that, as shown, we have two weights connected by a spring. Say the lower weight is of 10 pounds, the upper of 100 pounds. If one strikes the lower weight suddenly so as to compress the spring 1 inch, the reaction through the spring, when both are released, will kick the heavy weight to 1/10 inch, the amount of the kick or movement of the 100-pound weight by the reaction of the spring being in direct proportion to the masses involved. Exactly the same condition would apply in the right hand sketch of Fig. 1, where the weights are 10 pounds and 1 pound.

Illustrating Weight Principle

If, as in the illustration, we double the weight above to 200 pounds, we have increased the ratio to 20 to 1, but in a total weight of 210 pounds. The same effect we can get in the other instance by decreasing the weight below, making it 1/2 pound. Here in a weight of 10 1/2 pounds we have the same proportion of kick through the spring that we get in the first case in a 210-pound total.

Thus, it is reasoned, if one can get the weight under the springs in a motor car to the minimum amount possible, he will increase the comfort of his car and decrease the kick of the road bumps to the passenger in proportion.

Road comfort based on this principle can be followed from the ground up, as shown in Fig. 2. A road bump in this case, shown at B, first acts on the tires where part of the shock is absorbed; second, through the springs S, where the absorption is due largely to spring construction, and then through the springs of the upholstery in the cushions. The theory of unsprung weight can be followed through on all of these items and in each case will teach a lesson.

The first item of riding comfort is the pneumatic tire, the invention of which has made the fast road vehicle possible. Tire practice for large cars is well understood, yet a great many things have been learned regarding tire design. The basis of comfort of a pneumatic tire lies in its ability to absorb a shock directly at the place of contact without transmitting it through the line of mechanism.

Fig. 3 shows how a tire will wrap around a road bump and absorb it at a point of

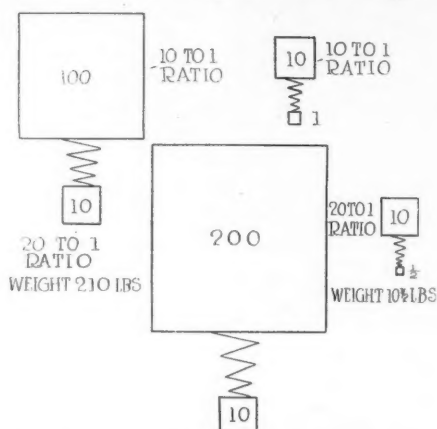


FIG. 1—ILLUSTRATING THE BASIC PRINCIPLE OF UNSPRUNG WEIGHT

contact instead of transmitting it through the mechanism. With a hard tire, bumps of over 1/2 inch compress the tire to such an extent that the shock is carried on up through the spring. With a large tire of the pneumatic type, bumps of double the size can be taken care of. A soft tire with low air pressure absorbs shocks a great deal better than a tire pumped up hard. The pressure per inch depends of course on the number of square inches of tire on the road and the car weight. A big heavy car must have large wheels and large tires pumped up to locomotive boiler pressure. This means that the tire effect at speeds is close to that of a hard tire of the same diameter.

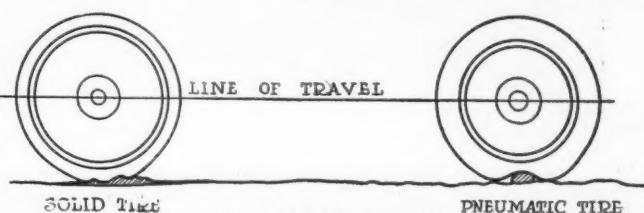
Low Tire Pressure for Small Cars

On a small car of light weight tires may be left large and be pumped up to a much lower pressure, allowing much more absorption of road inequalities and more comfort to the passenger.

A thing which makes this possible with the lightweight car is that with lower pressure one can use a thinner-tread tire, constructed for the purpose which will develop less internal friction and heat and hence which will not be damaged by continual flexing on the road.

It is the writer's opinion that light weight cars will be fitted with large tires of fairly thin section, pumped to a comparatively low pressure and that with these the comfort-efficiency will be greatly increased. The lighter the car the more practicable it will be to fit this tire. A

Fig. 3 — Illustrating how a tire will wrap around a road bump and absorb shock instead of transmitting it through the mechanism. With a hard tire bumps of over 1/2 inch compress tire so shock is carried through the spring



thick tread tire can not be left soft or the internal heat will disintegrate the rubber.

The theory of unsprung weight applied to the tire action shows at once that the only weight moved when the tire is striking an obstruction is the weight of the fabric and rubber immediately in contact with the obstruction. This being so small in proportion to the entire weight of the car it is possible for a tire to absorb a shock without transmitting an appreciable jar to the passenger.

When a bump or obstruction is met greater than can be handled by the resilience of the tire, the springs come into action. Before the spring can be compressed

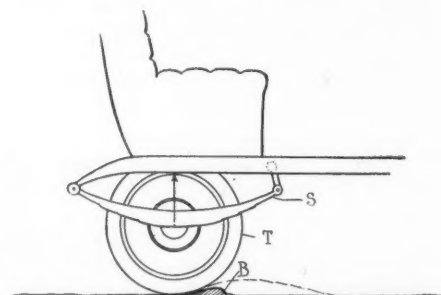


FIG. 2—THE BUMP B FIRST ACTS ON THE TIRE T AND THEN THE SPRING THROUGH THE CAR TO THE CUSHIONS

the entire rear axle must be lifted. This, with a certain time element—which is determined by the weight of the axle, the pressure of the air in the tires and the speed of the car—develops a certain momentum of the axle vertically, as shown in Fig. 2, and in going over the obstruction, the wheel will describe a certain trajectory, as shown by the dotted line, this trajectory dependent on the weight of the axle, the speed of the car, etc. The lighter the axle, the less the momentum which will be attained under the springs. This means that a spring of greater resiliency and easier riding quality can be used with a light axle than with a heavy, as it will take a lesser spring thrust to shorten the trajectory shown, with a light axle and wheel, than with a heavy one. The actual kick of the axle through the spring will depend very largely on the proportion of weight under the spring to that above the spring. The spring itself will merely increase or decrease the time element of the shock.

The seat cushions have very little to do with the comfort of heavy cars, except to

increase the rider's area of support. In this case, the heavier weight is below the springs, the weight above the springs being merely that of the passenger, or say 150 pounds. It requires no argument to prove that in a case where the rear axle is thrown off the ground as on a bridge approach or unexpected street crossing, a car weighing 500 pounds at the rear will throw a 150-pound passenger much less than a car weighing 3,000 pounds at the rear end. A heavy limousine on a bad bump can throw one against the roof with a great deal of force, largely through the energy of the seat cushion springs, stored up through the momentum of the car's weight below the cushions. Thus is seen the reason why in racing, where drivers are taking bad bumps at full speed, a seat cushion is rarely used and a hard seat is preferred so that the driver may be better able to hold his position. The theory of unsprung weight is basic in regard to car comfort.

There are three classes of road bumps which might be termed of first, second and

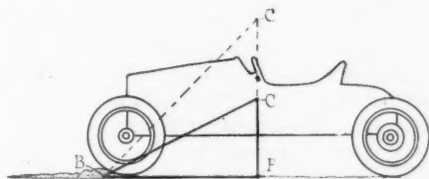


Fig. 4—The lower C represents the center of gravity of one vehicle which is said to cause less power to be consumed in going over bumps than a car in which the weight is higher

third magnitude. First-magnitude bumps are those obstructions whose opposition can be overcome by the resilience of the tires; those of second magnitude are those which also compress the springs and cause them to take the greater bulk of the shock; those of third magnitude cause the wheels to leave the ground entirely, the springs being compressed abnormally and the whole car lifted off the ground momentarily. The comparative magnitude of the shocks and the dividing line between each depends upon the factors of design of each individual car. These shocks again are divided into two classes: those which affect one wheel and those which affect both wheels of an axle.

Factors of Shock Magnitudes

If a car has extra large tires with a low air pressure the range of first magnitude road shock is large in comparison with the same class of shocks on a vehicle with tires pumped up to abnormal pressure.

Second magnitude shock range depends upon spring construction and the resiliency and length of these members together with the weight under the springs in its proportion to the weight above the springs. A lightweight car with very resilient springs and a light axle weight rarely meets a condition where the wheels actually leave the ground, as the trajectory of the wheels in going over even a sharp obstruction is very short and the momentum of the light axle very small compared with heavy combined axle-and-gearset practice. If a lightweight

car of proper design does meet an obstruction which throws the rear wheels clear of the ground, it easily takes care of a condition which with a heavy axle car is serious. Drivers of lightweight vehicles take bridge approaches and street crossings at speeds impossible to heavy-axle cars. Even when the wheels leave the ground, the proportion of the passenger weight in proportion to the weight underneath the cushion springs is so small that one is not thrown so violently out of his seat though all four wheels may leave the ground. For this reason he does not fear to let his car jump off the ground, as he does not get the dangerous throw which the heavy car gives.

Compares Car Design

This item of comfort possibility at once suggests to the engineer that a lightweight car must be designed more sturdily and with a greater factor of safety in its running gear and steering parts, and more especially in its wheel design, than a big car. One lightweight car, for instance—a high-speed lightweight car, although it weighs under 1,500 pounds completely equipped—is equipped with wire wheels of the same size, width of hub, and number of spokes as a 3,000-pound touring car.

The speed-comfort condition in light design also presupposes a steering gear of extra sensitiveness and with no back-lash.

Discussion so far in regard to comfort-efficiency has been confined to vertical road shocks; but the last few paragraphs have brought to the reader's mind a question as to how a car of light weight can be made

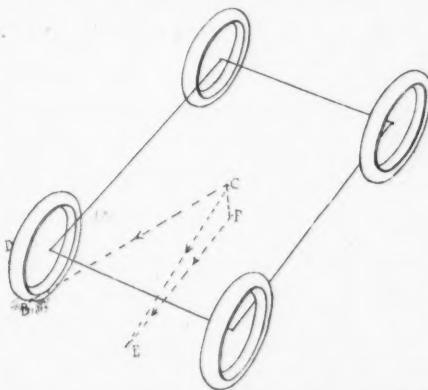


Fig. 5—The ability of a car to keep a straight course after striking a road obstruction on one side is expressed by the proportion CE over BE

to hold the road at high speeds, as does a car of real heavy weight.

American railway practice runs to great weight and Pullman cars are even weighted down and built extra heavy in order that they may ride easy. English railway coaches—two or three of which might be put in an ordinary American Pullman coach—are the easiest riding railway coaches made and travel at higher speeds than our American coaches, and with fewer accidents. These cars together weigh little more than a six-wheel truck alone used here on a Pullman coach. The weight of this truck is a large part of the reason for

the necessity of weight in the body of our Pullman railway cars. The little European coaches, many of them smaller than our ordinary street cars, run on six wheels arranged in three pairs and without trucks as we would recognize them. The unsprung weight therefore is very small and the cars ride very easily.

The same effect is gained in the light car on the road by using the theory of sprung and unsprung weight to enable the wheels to hold the road without tendency to jump up and down.

The railway vehicle is held to its line of travel by rails and at no time does one side meet with an obstruction very much greater than the other side. In a motor car it is different, as shown in Fig. 5. In this case, a car of short wheelbase is shown in diagram with the front wheel on one side meeting a bump. The car is considered as in motion and taking its power from its own momentum stored up by the energy of the motor in previous driving.

Let C represent the center of gravity and the center of weight. The line of shock therefore to the wheel will be the line C-B. The line of forward thrust of the car is represented by the line C-E, which is the longitudinal projection of C-B. B-E, the other projection, represents the side thrust of the road shock, tending to spin the car about its axis and center of weight C. The ability of this car to keep a straight course when striking a bump on one side is expressed by the proportion C-E over B-E.

Wheelbase and Propelling Power

If this car were of standard tread and 96-inch wheelbase, this ratio, supposing the center of gravity to be at the center of the car, would be as 12 to 7. If the car were of 112-inch wheelbase, the ratio would be as 2 to 1. If the car were narrow tread, 40 inches by 110 inches, the ratio would be 11 to 4. These figures show the proportion of side thrust given on car so with varying tread-to-wheelbase ratios and the proportion of engine power remaining used up in forward thrust, instead of being wasted in taking care of the side thrust on the wheel. This reason explains why a long wheelbase car of equal weight and wind resistance requires less engine power than a short wheelbase car. The car with a great tread-wheelbase proportion shows almost double the efficiency of the shorter wheelbase car and at the same time shows a proportionally greater ability to hold the road and steer properly through the lesser proportion of side thrust. This explains the wonderful road quality which was found in the cyclecar and which has been carried on to greater perfection by some of the lightweight car makers.

Since lightweight has been found advisable in this article and since it is hard to obtain ideal lightweight conditions with a standard-tread car of long wheelbase, real comfort-efficiency engineering would point toward a car whose great tread-to-wheelbase ratio was obtained by narrowing the

tread rather than by lengthening the wheelbase. This type of car is bound to become popular as the public realizes its wonderful road qualities under all conditions.

For real comfort-efficiency, therefore, a car must be light and of great tread-to-wheelbase ratio with minimum of unsprung weight. Further than that, the weight of the car may be hung low to save power.

A low-hung car skips over the smaller bumps without a direct down-shove in just about the same way that a stone skips over the water instead of plunging in when thrown at a flat angle. In Fig. 6 is shown in diagram an obstruction at the point B. The center of weight of the car is shown at C. On striking the bump B, the line of shock is C-B. Projecting this, the hori-

zontal thrust of the momentum is represented by B-F, the energy absorbed in lifting the car over a bump by F-C, the efficiency of the car being represented by the proportion of B-F to F-C. It requires no argument to prove that if C is high in the air, as shown by dotted lines, FC will be greater in proportion and it will require more power to lift the car over the bump than if the weight is low. These points have to do with the ability of the car to hold the road and to be steered in a straight line.

Another point which is especially important in a wide-tread car is that of the differential. If one wheel gets more weight than another on this type of car the rear wheel on the light side will spin or slip more on the pavement than the one on the

heavy side, which means side thrust on the steering gear and wheel.

Other items of comfort efficiency might be discussed, and those mentioned might be followed to greater length, but the idea is that there are items that have been more or less discussed, which should be given all of the recognition which they deserve in gaining for the rider in the present day motor car that comfort will be the eventual standard of road quality.

The American motor car is approaching perfection in mechanical detail. The next step is the focusing of all energy toward the production of a vehicle of maximum comfort rather than maximum speed. If these two can be combined with safety, and luxurious building, the makers of this type of car will benefit as benefactors.

Motor Cars and Sundries to Be Exposition Features

Industry Well Cared for at Panama-Pacific Fair

SAN FRANCISCO, Cal., Nov. 18—The motor industry will be prominent in the Palace of Transportation at the Panama-Pacific international exposition the coming year. Nearly 40 per cent of the space in the structure built to house the transportation exhibits is given over to the makers of motor cars and accessories.

Uniform decorations will prevail. Each exhibitor pays pro rata according to his floor space and this fund is used to provide decorations for the section. There are no booths of any kind, no rails or dividing screens used between exhibits. The floor covering in the exhibit space is in gray color, the aisles and a 6-inch strip marking the interior dividing lines of the exhibits being of a brown color. At the corner of each exhibit is a large vase of staff work. The name of the street or avenue on which the vase is placed, is lettered on the base of the vase and the name of the exhibitor on the bowl.

Big Space for Motor Industry

The motor car section occupies nearly the entire eastern half of the building. Running along the north and south central aisle in the nave of the building, is a facade of Italian pergola design and divides the section from the other portion of the building. There are domes over the entrances to the aisles in the section or a lattice-work effect.

The accessory manufacturers and dealers are given space along the side walls of the section. The walls about and above their exhibits will be decorated by the exhibitors themselves.

The trusses which carry the roof average about 45 feet in height from the floor. This gives plenty of space to work out a unique decorative scheme which has at the same time a utilitarian value. A panorama of the Lincoln highway will be shown.

Along the north and south line of posts supporting the trusses and reaching from the central portion of the building to the

main entrance, extends this panorama about 20 feet above the floor. It is 350 feet long. This gives a scale of approximately 10 miles to the foot and allows the general topography of the country between New York and San Francisco, the terminal points of the highway, to be clearly shown. The end of the panorama representing New York is placed at the center of the building and the San Francisco end is near the main entrance.

Decorations Are Attractive

Out from the posts a distance of 4 feet are erected braces which support the panorama. The lower portion of the panorama is of plastic composition and shows the topography in bas-relief. The bas-relief slopes gently upward and melts into a flat painted canvas which extends a distance of 16 to 18 feet to the ceiling. The high colors used on the bas-relief and the painting will bring out the impression of great distance. Piers are built about the posts, of staff-work and arches placed between the piers to give a mission effect to the scene. The whole effect gained from the use of the arches and the piers is that of a viaduct and then the spectator is looking out over a vast expanse of country. A skyline effect is given by the ceiling decorations.

The highway is represented in the bas-relief by a metallic track on which can be mounted miniature models of motor cars or motor trucks. If a race is being run or an endurance tour across the continent, the position of the various cars can be easily noted and their progress followed from day to day by this means.

The illuminating effects for the panorama are well planned and in a way to make it appear entirely natural. It is arranged so that in the morning it appears light at the New York end while the San Francisco portion is still in darkness, showing the considerable variation in the time between the two points.

As the day advances, the light grows stronger westward along the highway giving the effect of the advance of actual daylight. By evening the lights are growing dim at the western terminus while the eastern portion is dark.

In addition will be panoramas of the Trail to Sunset reaching from Chicago to San Diego and the Mid-Continental from Winnipeg to Galveston. They are worked out on lines similar to that of the Lincoln highway.

The Lincoln highway panorama is the first one which greets the eye on entering in motor car section. It will not be greatly panoramas appear back of this one on other lines of posts. It adds a distinctive decorable outside the section. The other tive effect to the scene and will prove one of the attractive sights of the exposition.

To Be Exposition Club

Instead of the exhibitors having individual offices, owing to the space being so limited, large club rooms are being fitted up on the mezzanine floor. Each exhibitor will be a member of the Exposition Transportation Club which will have supervision of the club rooms. Guest privileges will be extended to any visitors that members may desire favors shown. All the conveniences of modern club life will be found, telephones, public stenographer, private offices, women's parlors. The members share in the cost of the maintenance of the club. The social life of the transportation people will center about this club. During conventions of transportation interests, the club rooms should prove of much worth.

The official headquarters for motorists will be found in the office of the California State Automobile Association, located just to the east of the main entrance. An information bureau will be maintained.

In the building will be shown all modes of conveyance and equipment, for land, water and sky, in the earliest and latest forms.

Two New Moline-Knight Body Styles Are Announced

Seven-Passenger Limousine and Sedan Make Their Appearance

TWO new inclosed body styles, a limousine and a sedan, are announced by the Moline Automobile Co., Moline, Ill. These bodies are mounted on the Moline-Knight chassis, which is equipped with a 4 by 6 Knight motor. The gearset on these cars is of the three-speed type, whereas on the touring cars a four-speed is used.

The new limousine which sells for \$3,800, has the tonneau trimmed with gray whipcord and the front seats with black-enamel leather. The body accommodates seven passengers and the extra tonneau seats face forward and are arranged so they may be folded against the side of the body or placed in sockets in the compartment division. These seats may be removed easily.

The window glass is frameless and fitted with a Cowles mechanical window regulator. The rear window is stationary.

The framework of the body is of ash and the panels aluminum, this metal being used also for the window ledge finish, door moulding rails at the side of the front seat and top of the front doors.

The rear doors are hung with concealed upper hinges and the lower of the exposed covered type. Handles are of rubber and nickel. These doors, as well as the windows, are prevented from rattling by bumpers. The pillar lamps are arranged so that light will be thrown on the running board. Operation is by a switch on the dash. Tonneau illumination is by a large dome light in the center and two smaller lights in the rear corners above the seat.

The general makeup of the sedan is similar to that of the limousine. A dark gray whipcord upholstery is used in place of the lighter gray in the limousine. The frame of the sedan is of ash except the seat lids, lining boards and certain strainers, where other wood can be used just as effectively. All panels are of 22-gauge cold-rolled body steel, with joints either welded or else are covered with aluminum molding.

Furnishings in these cars include toilet

case, electric megaphone, combination hat rack and luggage carrier, umbrella drain and holder, cigar lighter, flower vase, combination ash tray and match box and carpet to match the tonneau cloth.

The wheelbase of the Moline-Knight chassis is 128 inches and it is fitted with a cone clutch and a rear axle with spiral-bevel gears to obtain quiet running.

FARMERS TAKE TO ELECTRICITY

Milwaukee, Wis., Nov. 23—Commensurate with the growth of electric motor car lighting is the use of electricity on Wisconsin farms. Leading agriculturists say that the electric system, while initially more expensive, lends itself much more easily and safely to the extension of farm lighting systems to include even hay barns. In some cases 6-volt systems have been installed and globes equipped with special reflectors to secure the distribution of light rays of higher voltaged systems. By this means the rural motorist is able to keep his batteries in his car during the day and in case of a breakdown of his farm engine, use the motor car power to generate his current, or so much as is needed to fill gaps. This idea is believed to be a development of the ingenious arrangement made by a number of Milwaukee motorists during the last two seasons to light their summer homes or camps with current from their cars, some even using the side and head lamps to illuminate the house or shack.

OWNER'S ESTATE HELD LIABLE

Neillsville, Wis., Nov. 23—A court decision of wide interest because of its establishment of the liability arising out of accidents has been handed down at Neillsville, Wis. Three occupants of a car which was wrecked, killing the owner, who also acted as driver, were awarded a total of \$5,200 damages against the owner's estate.

In September, 1913, M. D. Garrison, of Throp, Wis., while driving in company with William C. Shock, James Connors, Hixon

Mead and Joseph Klouda, met with an accident. Mr. Garrison was killed and the other occupants seriously injured. The occupants proceeded to file claims for damages against the estate. Mead sued for \$10,000; Shock for \$5,000; Klouda for \$5,000, and Connors for \$7,500.

County Judge O. W. Schoengarth, presiding over the probate court at Neillsville, received the claims and called in Judge Henry Lebeis, of Chippewa county. Judge Lebeis decided the claims were proper, excepting as to amount, and awarded the defendants damages as follows: Mead, \$3,000; Shock, \$100; Klouda, \$350; Connor, \$1,100.

The attorneys for the Garrison estate have appealed from the probate court's decision and will fight the allowance of the claims, court procedure in Wisconsin being such that the estate has not had an opportunity to make a defense until this juncture.

So far as can be learned, no estate ever has been obliged to pay damages under similar circumstances, it being generally accepted that the occupants of a car which meets with accident enter it upon their own responsibility and therefore have no claims if injured.

SEEKS WOMEN DEMONSTRATORS

Detroit, Mich., Nov. 23—"Equal rights" in the merchandising field as well as in the political arena has been afforded women by the action of Walter E. Flanders, president of the Maxwell Motor Co., who is making a canvass of the country to secure women demonstrators of the Maxwell car. Wishing to appeal to the woman buyer, President Flanders believes that women agents will be more successful in the feminine market than men. His plan to engage women demonstrators has received the endorsement of Mrs. Harriet Stanton Blatch, president of the Women's Political Union; Florence Guersey, head of the New York State Federation of Women's Clubs and several other leaders in the feminist movement.



The left illustration shows the newly-announced limousine mounted on the Moline-Knight chassis. This car sells for \$3,800 and is trimmed with gray whipcord in the rear and black-enamel leather in front. The new Moline-Knight sedan is shown at the right and its general features are similar to that of the limousine. These inclosed cars are fitted on a chassis with a three-speed gearset, while the open cars have one of the four-speed type.

The Readers' Clearing House

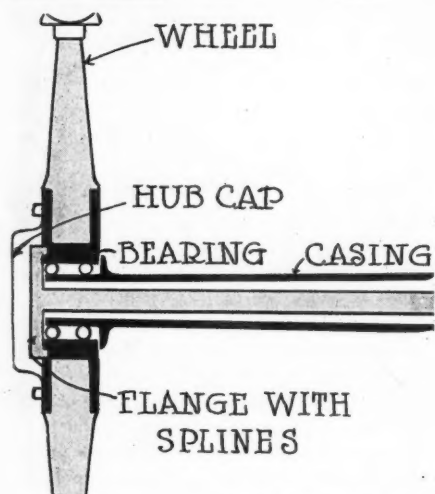


Fig. 1—The above is an illustration of a floating rear axle. This type has the wheel bearing on the axle housing and the end of the axle shaft drives the wheel by means of splines

MAKING THE CAR A SPEEDIER ONE Body and Motor Changes Necessary— Chassagne's 1-Hour Record

SEATTLE, Wash.—Editor Motor Age—Is there an agency in this country for the Sigma, the French small car, and what is the address?

2—Is there an agency for the Fiat car, such as the one driven by Teddy Tetzlaff, and what is the price of the car?

3—What is the bore and stroke of the motor, and the horsepower?

4—At what rate of speed did Jean Chassagne break the 1-hour record?

5—What necessary changes must be made to make the car faster, that is, for speed work?—Robert T. Masumoto.

1—The Sigma was exhibited in Boston recently by Robert P. Breeze, New York city. Motor Age does not know the address of the exhibitor, but if you will communicate with the La Croix Auto Co., 1770 Broadway, agent in New York city for many foreign cars, you no doubt will be able to get in touch with the Sigma agent.

2—The Fiat company has an agency at 1776 Broadway, New York city, operating under the name of the Fiat Automobile Co. The car which Tetzlaff drove is a special Fiat racing car.

3—Tetzlaff's Fiat, which won the Santa Monica road race, is a four-cylinder of 5 by 7½. It develops about 150 horsepower.

4—Chassagne's 1-hour record, made in a twelve-cylinder Sunbeam, is slightly over 107 miles in the hour.

5—First decrease the weight of the vehicle as much as possible, removing all unnecessary, that is, non-essential, equipment. Since wind resistance is a great factor as regards speed, it becomes evident that every effort should be made to streamline the car. A long tapering hood coming almost to a point, as in some racing cars, is good. Just enough space should be left in front to allow air currents to reach the radiator. It is considered

more important to care for the rear of the car than it is to look after the front.

After the parts have been streamlined as much as possible the mechanical end should be considered. If possible, the valve seats should be increased in size and new and larger valves obtained. If only the intake valves can be made larger, it is a good idea to do so. Increasing the size of the valve seats may be done with a counterbore, or an oversize valve re-seating tool. New valves may be purchased at a comparatively low price. The lift of the valves may be increased slightly by substituting larger cams. Much will depend upon conditions as to just how the magneto shall be reset. Setting the magneto ahead will cause the motor to stop if the throttle is set down too far. If it is possible to use a larger carbureter and intake header it is best to do so, for if the intake valves are made larger more mixture can be accommodated. The frictional loss in the motor is reduced somewhat by removing one of the piston rings, but if the pistons have but two narrow rings this should not be done. Lighter pistons help matters materially. Some use magnalium, semi-steel or steel, while others take the old pistons and drill holes in them. Care should be taken in doing this work, that each piston weighs the same as any other piston. If possible use lighter connecting rods, but it would not do to remove metal from the old ones, for the strength may be impaired. New rods of stronger metal and thinner section, or hollow rods, are better.

One of the first essentials for a speedy car is to have a pressure oiling system with a hand control on the dash or other place within easy reach of the driver. This consists merely of a hand pump drawing oil from the tank and forcing it to the crankcase. Ball check valves properly placed can control the direction of flow.

In nearly all racing cars the motors are equipped with magnetos of the double-distributor type, so that they feed to two sets of spark plugs at the same time.

TYPES OF REAR AXLES DEFINED Meaning of Floating and Semi-Floating Construction

Pensacola, Fla.—Editor Motor Age—Kindly give the meaning of the terms applied to rear axles: Floating, semi-floating, live and three-quarter floating axles.—Frank S. Rinshau.

Ordinary motor car nomenclature gives us three types of live rear axles, called, respectively, floating, three-quarter floating and semi-floating. Live axles are those which turn, such as those named, while dead axles are those used on double-chain drive cars, and do not turn.

The floating axle, as the name implies, is one that floats; that is, it turns around

but does not carry any weight. It is used to gain rotary motion only. The semi-floating axle, however, not only turns the wheels, but takes some of the weight of the car. The difference between these two types of axles is in the position of the wheel bearings. In the floating axle the wheel bearings are outside of the housing, as shown in Fig. 1. The rear wheels of the car rest upon these bearings. It can be seen plainly that if the wheels rest upon the bearings and the bearings upon the housing that the housing must support the weight of the car. The end of the axle shaft has some form of jaw clutch which fits into depressions in the wheel hub. In the floating axle this connection between axle shaft and wheel is flexible, but in the three-quarter floating type the end of the shaft is permanently attached to the wheel, being held usually by bolts.

In the semi-floating type of rear axle, illustrated in Fig. 2, the bearing for the wheel instead of being outside the housing is inside the housing. The wheel is placed on the axle and held there by a key, usually. Sometimes the ends of the axle shafts are square and the inside of the wheel square so that no key is necessary. With the wheels on the axle shafts, nuts are screwed on the ends of the shafts to prevent the wheel from backing off. The nuts are locked with cotter pins.

Adjusting Schebler Model H

Indianapolis, Ind.—Editor Motor Age—Kindly explain and illustrate the adjustment of the Schebler carbureter as used on the Dudley cyclecar.

2—After running the engine for a time and then switching off the current, the engine will give five or six short jerky explosions. What causes this?—C. Resner.

1—The Dudley uses a special model H Schebler and the adjustment of the fuel is by means of the cam shown in Fig. 3. This cam gives adjustments for low intermediate and high speed. While the engine

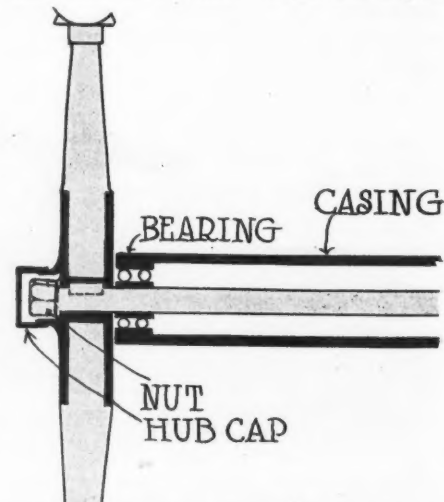


Fig. 2—Semi-floating type of axle which has the wheel bearing inside the housing, and the wheel held in place by a castellated nut

is running with quarter-open throttle, press the air valve A inward and if the motor speeds up it is an indication more air is needed; if it slows down, it means less air is required. With a given throttle setting, move the cam either to right or left until the fastest speed can be obtained of the engine without touching the throttle. It may be necessary to readjust the air valve to get good results, but this is not usual.

2—It may be caused by an excessively hot engine, carbon in the cylinders or possibly a faulty ignition switch.

LARGER VALVES FOR MORE POWER

What \$2,000 Car Will Travel 60 Miles Per Hour?

Jefferson, Ia.—Editor Motor Age—Are there any stock touring cars selling at or below \$2,000 capable of making more than 60 miles per hour?

2—What effect has the installation of lighter pistons and connecting rods on the 1914 Cadillac motor?

3—Would enlarging the valve openings, or the fitting of a new camshaft be desirable in addition to lightening the reciprocating parts of this motor in an effort to secure more power and better acceleration, as well as greater available maximum speed?

4—Where could such a camshaft, if desirable, be obtained?—Cadillac Owner.

1—Motor Age knows of no touring car selling at or under \$2,000 which is capable of traveling over 60 miles per hour.

2—You would get a power increase by using the lighter reciprocating parts. Motor Age does not advise you to use lighter connecting rods unless you know the new rods can stand the stresses imposed.

3—The fitting of larger valves will undoubtedly help to increase the power and if you fit a new camshaft the cams should be designed to hold the valves open a little longer than usual. It would be best to try the old camshaft and if the results are not as expected then a new shaft could be fitted.

4—The local machine shop can turn a shaft for you. It is expensive to have a new shaft made and on the whole it is not worth while.

Motor Type and Power Obtained

Kearney, Mo.—Does an overhead-valve motor give more power than a T or L-head? Is it possible to get more miles per gallon out of gas with an overhead valve motor?—Neff Bros.

It is claimed that a valve-in-the-head motor of a given size, weight and manufacture gives more power than an L-head or T-head of the same size, weight and manufacture. However, this is not always true. It is difficult to get two motors an L-head or T-head and a valve-in-the-head which

show the same design with the exception of the valve arrangement. It is possible that a T-head motor of a certain size has more power than a valve-in-the-head of the same size, owing, perhaps, to the intake manifold design, the bearing design and weight of the various reciprocating parts, etc. In order to answer your question definitely it would be necessary to make actual tests of three such engines. In a number of tests performed in the past the

Questions Concerning Magnalium as Material for Pistons

LOUISVILLE, Ky.—Editor Motor Age—What is the difference between aluminum and magnalium as regards weight, strength, expansion and wearing qualities?

2—What would be the proper clearance for aluminum pistons, top and bottom, for a 3¼-inch motor?

3—What is the highest speed made with a Ford motor, and by whom?—N. W. Funk.

1—Aluminum is an element with a specific gravity in the pure state of 2.56, a tensile strength of 26,800 pounds in ingot form, and a coefficient of expansion of .000023.

Magnalium is an alloy of aluminum and magnesium and has a specific gravity of 2.5, a tensile strength of 23,000 pounds and a coefficient of expansion of .000025.

As regards the wearing qualities for piston material the magnalium is superior to aluminum. The latter will not stand the wear of piston travel.

2—You can safely use .003 at the bottom and .004 at the top and lubricate with a very viscous oil. Motor Age advises you not to use aluminum for piston material. This has been tried and the results are not as good as with magnalium.

3—Motor Age has no record of motor speeds in a Ford car. Many who have reconstructed the engines have obtained over 2,000 r.p.m. without a drop in the power output.

MAGNALIUM PISTON CLEARANCES

Characteristics of Parts Made of This Metal—Its Composition

Sheridan, Wyo.—Editor Motor Age—Kindly give some information as to the wearing qualities, expansion and strength of magnalium pistons.

2—How does it compare with light cast iron pistons as to above qualities?

3—Would Motor Age advise using magnalium in a small high-speed motor in a touring car where the car would occasionally be stripped down for a race?

4—Is not the base of magnalium, aluminum, which is a very poor wearing metal?—E. E. Arnold.

1—Read the answer to N. W. Funk on this page.

2—It is a better bearing metal than cast iron and should be expected to wear better. However, if improperly made and with insufficient clearance you will have trouble. The tensile strength of cast iron is about 18,000 to 20,000 pounds, which is less than that of magnalium which is 23,000 pounds per square inch.

3—Motor Age does not advise using magnalium pistons unless the car is to be used for high-speed work. You will encounter trouble if the car is to be used for ordinary touring.

4—Aluminum is the base but when in

valve-in-the-head has shown up best and many engineers claim that type to show at least 20 per cent more power than the others named.

Valve Timing of Flanders

Brooklyn, N. Y.—Editor Motor Age—What is the correct valve timing of the 1912 Flanders?—J. K. R.

The valve timing figures of the Flanders were given in Motor Age issue of November 19, page 34.

composition with magnesium an alloy is formed with different properties. Aluminum alone is not good for pistons because it will not stand the effect of piston travel at high speeds.

WANTS TO DISCARD IRON PISTONS

Data on Fitting of Light-Weight Parts—Oil to Use

Tulsa, Okla.—Editor Motor Age—In having cylinders rebored and ground, and pistons fitted, what clearance should be given cast iron pistons?

2—What clearance should be given magnalium to have best compression for speed? Also what clearance should be given steel pistons?

Kindly give best clearance to produce speed, yet stand heat, as I intend having the cylinders reground and fit new pistons.—B. A. Britton.

1—The clearance figure varies with different makes of engines. You may use .0005 at the bottom and .002-inch at the top and be safe, or you can increase these distances slightly, say to .001 at the bottom and .0025 at the top.

2—The clearance for magnalium should be .0005 more per inch of bore than for cast iron. In other words, with a 4-inch cylinder with present clearances of .001 bottom and .002 top, add .002 to the bottom, making it .003 and .002 to the top, making it .004-inch. With steel pistons you can add .001-inch clearance to that now used for cast iron. With such clearances a heavier oil should be used and in racing cars most of the drivers use castor oil or a mixture of castor and some other heavy oil. You will find that at low speeds and a light oil, piston slaps will result.

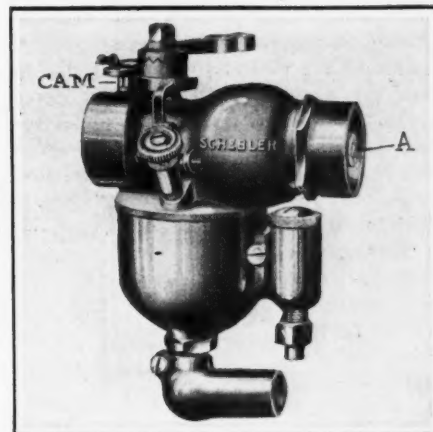


Fig. 3—Schenck model H carburetor showing the adjustment points. The cam should be turned either to the right or left until the engine runs at its maximum with a given throttle setting

Questions Answered and Communications Received

Robert T. Masumoto.....Seattle, Wash.
Frank S. Rinshau.....Pensacola, Fla.
C. Resiner.....Indianapolis, Ind.
Cadillac Owner.....Jefferson, Ia.
Neff Bros.....Kearney, Mo.
J. K. R.....Brooklyn, N. Y.
N. W. Funk.....Louisville, Ky.
E. E. Arnold.....Sheridan, Wyo.
B. A. Britton.....Tulsa, Okla.

No communication not signed with the reader's full name and address will be answered.



The Motor Car Repair Shop



IN connecting electrical meters in the lighting system it should be borne in mind that an ammeter always is placed in series with the line and a voltmeter across the line. The two arrangements are shown in Fig. 1. Many car owners whose vehicles are equipped with electric lights wish to know the voltage or amperage of the generator while the car is in motion. The installation of a meter will show this. Before purchasing a meter for installation one must know the scale range necessary. For example, it would not do to place a meter with a maximum reading of 10 amperes in a line whose amperage may at time reach 30 amperes.

Oxygen for the Motor

Recently a reader of Motor Age suggested oxygen be used to assist the motor, so that by introducing a volume of the gas into the cylinders with the regular charge of mixture, a better explosion would take place, resulting in little carbon being deposited. Theoretically the use of oxygen in this way will help considerably and a system as shown in Fig. 2 could be installed. This consists of an oxygen tank with gas under high pressure connected to the inlet manifold, but in the line is placed a reducing valve and a control cock. The reducing valve is necessary to bring down the pressure so that it can be used safely in the motor. By allowing a small stream of oxygen to be drawn into the cylinders with the regular charge from the carburetor, no doubt a more forceful and cleaner explosion would be obtained. However, the cost of oxygen in tanks might be prohibitive. Most of the concerns manufacturing oxy-acetylene welding outfits are in a position to supply oxygen in tanks of a convenient size to be carried in the car.

An Auxiliary Fuel System

There are many owners who are dissatisfied with the straight pressure system of feeding the fuel and who would like to construct a gravity feed without going to the trouble of fitting a tank under the front seat. Many also who are satisfied with the pressure feed like to experiment with various other methods of feeding the fuel. A simple pressure-gravity feed is shown in Fig. 3.

This consists of an auxiliary tank containing a float mechanism similar to that used in a carburetor

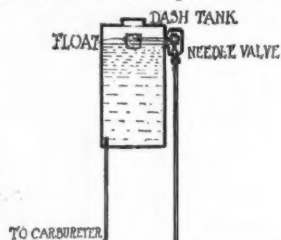


Fig. 3—Installation of pressure-gravity feed system, which makes use of the tank at the rear of the chassis and an additional tank for feeding the fuel to the carburetor by gravity. The auxiliary is fitted with some means of control and the simplest is a float mechanism similar to that employed in a carburetor. The illustration shows the fuel valve controlled by a pivoted lever the other end of which is fitted with a float

Connecting Electric Meters

and to the tank two pipes are attached, one leading to the carburetor and the other to the rear fuel tank. The latter has another line leading from it to an air pump used for obtaining the desired pressure in

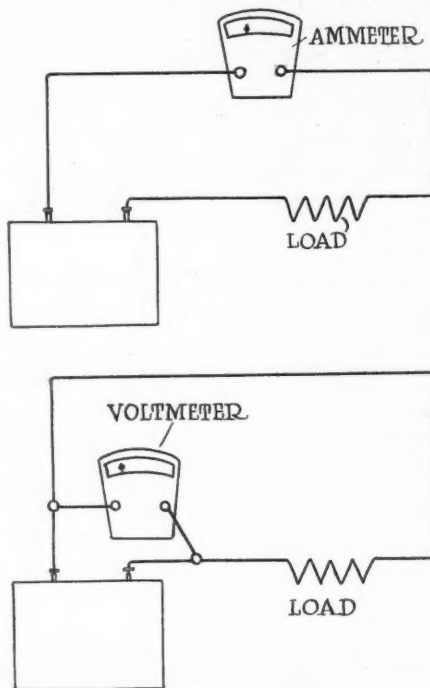


Fig. 1—Showing how an ammeter and voltmeter should be connected in the circuit. The first named instrument always is connected in series with the line and the voltmeter across the line as illustrated. Before installing a meter one should know the characteristics of the line so that an instrument with proper scale can be procured

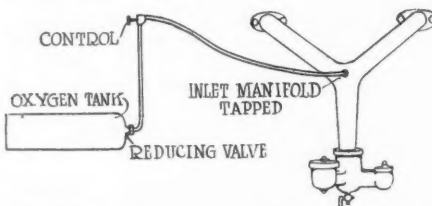


Fig. 2—Suggested scheme for those desiring to try oxygen as a means of obtaining more power. The oxygen tank has a line running from it and in this line is a reducing valve and control. The line from the latter runs to the intake manifold. When in operation a small stream of oxygen is sent into the cylinders with the regular mixture

the tank. In operation the fuel from the rear tank is forced to the auxiliary tank, which may be placed on the dash above the carburetor, and from the auxiliary tank the gasoline is fed to the carburetor by gravity. The construction of the float mechanism is not a difficult job as the design may be copied from the carburetor, nearly all of which have some means of regulation, as shown in the illustration on this page.

In operation either a hand pump or a motor-operated air pump is used to force sufficient air into the rear tank to bring the fuel into the auxiliary tank, from which it feeds naturally to the carburetor.

Making an Electromagnet

A simple electromagnet to operate at 6 volts may be made by winding about 300 feet of No. 13 gauge B. & S. wire upon two $\frac{1}{2}$ by 5-inch soft-iron cores. This design should give an intense magnetic pull, for it contains about 10,000 ampere-turns, and the strength of an electromagnet is dependent upon the number of such turns. The entire coil will consume about 10 amperes at 6 volts.

Practice Controlling Skidding Car

There are many owners who have not experienced the difficulty of controlling a car once it has started to side slip or skid forward and it would be a good plan if those owners would practice car control on slippery streets. The car should be taken to some very wide street in the suburbs and an attempt made to cause it to skid. This can be done by applying the brakes harshly and throwing out the clutch. The street upon which this practice is advised should be very wide and free of obstruction, so that no harm can be done to the car during the practice skids. The driver will find that turning in the opposite direction from which the car is skidding usually helps. He also will find that applying the brake only will tend to keep the car straight and that sometimes the skidding may be stopped by slight acceleration for a short period.

Removing Road Tar

When the car body becomes spotted with road tar a good substance to use for removing the spots, is salt butter. This should be applied as soon as possible, for should the tar begin to harden, refinishing of the body may be necessary. Some have tried various oils for loosening the tar, but most of them affect the varnish or paint of the car. The above suggestion, though, will accomplish the purpose of removing the stains.



The Accessory Corner



New Grossman Spark Plug

THE Emil Grossman Co. Inc., New York, has just announced a new type of spark plug, which instead of using a bushing for stuffing the porcelain into the shell, has the insulator cemented into the shell. The appearance of the new plug also differs from previous types of this make in that the porcelain is dome-shaped, as shown in Fig. 2, instead of tapered. It has been decided to call this the One-Piece plug.

In making this plug the cement is poured into the space between the porcelain and internal threads of the shell and the entire plug then baked. This construction does away with gaskets and makes for a leak-

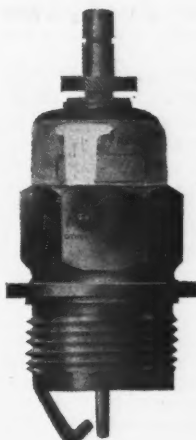


Fig. 2—A new Grossman spark plug selling at 75 cents. It has the porcelain cemented to the shell

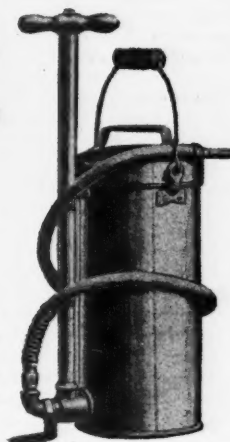


Fig. 3—Runyon self-measuring grease cabinet by which $\frac{1}{4}$ pound of grease is pumped to a compartment with one stroke of the piston

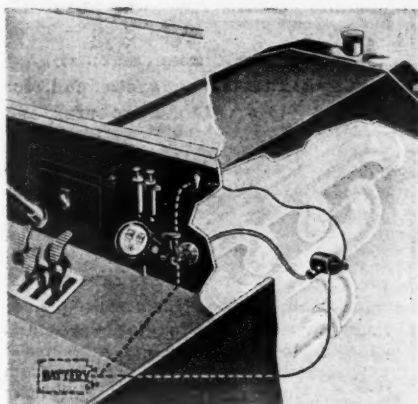


Fig. 1—Ieco Manifold plug which may be used as an electric primer, an extra air inlet as a means of saving fuel and also to introduce kerosene into the cylinders in order to free them of carbon. In its action as a primer the Ieco utilizes the heat of an electric coil for vaporizing the fuel

proof joint. The terminal screw also is sunk and baked into the porcelain and the grounded electrode is bent so as to keep oil away from the gap. This new plug sells for 75 cents; is all sizes.

Runyon Self-Measuring Grease Cabinet

Garagemen who have experienced difficulty in filling transmission cases, etc., with grease will be interested in the self-measuring cabinet manufactured by the Runyon Mfg. Co., Grand Rapids, Mich. This cabinet, shown in Fig. 3, uses an air pump for forcing the grease, contained in the large can, into the compartment requiring it. Each stroke of the pump delivers $\frac{1}{4}$ pound of grease through a hose and nozzle. With this device there is little waste, it is claimed, and the grease is delivered to the part in a much cleaner condition than when inserted by hand or with a wooden spade. The price is \$5 for the size holding $7\frac{1}{2}$ pounds of grease.

Teco Electric Generator

A belt-driven generator designed for

charging motor car batteries has been brought out by the Tritt Electric Co., Union City, Ind. This generator, which weighs 12 pounds, and is 5 by 6 by 8 inches overall, is of the permanent-magnet type and is fitted with a cutout, which is an electromagnet with a compound winding. Two of the main features of the Teco, shown in Fig. 4, are its price, \$20, and the output, which is 16 amperes at 11 volts at a speed of 2,500 r.p.m. This machine may be installed on cars not equipped with electric lighting systems, simply by belting up the generator and with an accumulator in connection forms a simple self-charging battery lighting, or ignition system. The cutout used with this system, as well as the battery, is not included in the price quoted above.

Ieco Hand Warmers

A simple device for keeping the hands of the driver warm is shown in Fig. 4, and called the Ieco Steer Warm. It consists of two copper plates between which is a coil of wire, the coil being heated by

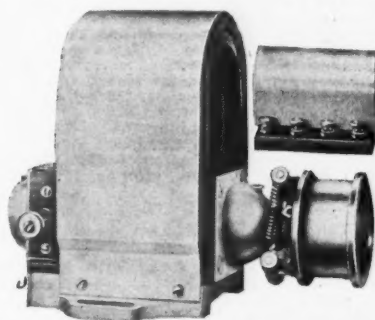


Fig. 4—The Teco, a belt-driven electric generator which sells for \$20 and has a current output of 16 amperes at 11 volts. This output is gained at an armature speed of 2,500 r. p. m.

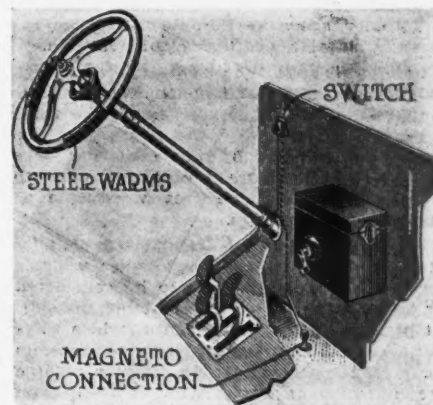


Fig. 5—Ieco hand warmers as they appear installed on the steering wheel of a Ford car. These warmers consist of two copper plates, with a coil of wire between them and the whole covered with leather. The Ford magneto current heats the coils which warm the plates. A storage battery may be used when magneto current is not available

electric current from a storage battery, or in the case of a Ford car, from the magneto, as shown. Over the plates is a laced leather covering. It is stated the grips consume only 18 watts and that once a certain temperature is reached it does not rise or fall if the switch is turned on. This device is made by the Interstate Electric Co., New Orleans, La., which also markets the Ieco manifold plug, which is designed to vaporize a priming charge, admit auxiliary air to the manifold at higher speeds and act as a means of introducing kerosene into the cylinders in order to clean them of carbon. The plug is electrically operated from a battery, as shown in Fig. 1. It consists of a retainer for a heating coil over which gasoline passes. This vaporizes the fuel so that it can be used for easy initial starting. Priming fuel is sent to the Ieco through a cup on the dash and from it by piping as shown.

Smith Car Lock

The George P. Smith Auto Lock Co., East St. Louis, Ill. is marketing a motor car lock which prevents the clutch from being operated. After throwing out the clutch the lock is turned and the clutch is kept disengaged until the lock again is opened.

Yankee Folding Tire Pump

A single-cylinder, hand-operated tire pump which can be placed into the tool box is being sold by the Apex Electric Co., Chicago, at \$5. This pump provides a leverage of 7 to 1. It is attached to the running board of the car and with its long leverage and displacement of 36 cubic inches makes pumping easy.



From the Four Winds



NO 1915 Show in Toronto—There will be no motor show in Toronto this year because a suitable location is not available.

Safety Islands for Milwaukee—Twelve safety islands will be constructed in Milwaukee during 1915 to supplement the three experimental islands placed this year. The islands, surmounted by pillars bearing large red light globes, are useful not only to divide traffic but have proven valuable as accident preventatives.

Park in Court House Grounds—A plan for utilizing a part of the court house grounds for parking motor cars is to be considered by the county commissioners at Indianapolis. At present the traffic ordinance forbids leaving a car standing in the downtown streets for a longer period than 90 minutes. There are not sufficient garage facilities down-town to care for cars driven by business men. It is planned to charge a parking fee of 10 cents at the court-house grounds, and a checking system will be installed. It is thought the new plan would reduce car stealing to a minimum.

Concrete Interests Milwaukee—As the result of the success met with by the county of Milwaukee, Wis., in paving its country roads with concrete, the city of Milwaukee next spring will experiment with concrete pavement on city streets. Already several contracts have been awarded for paving alleys with concrete and it has been found that the work can be done at 92 cents per square yard for concrete compared with approximately \$2 for brick alley surfacing. A similar economy is expected in street paving. For many years past the city has favored asphalt, which costs about \$1.75 per square yard.

Offer Cars to Canadian Troops—More than one thousand motor cars are to be equipped by the Automobile Club of Canada to form a battalion in conjunction with the Home Guard. The club, taking into consideration the prominent part that motor cars have played in the war, last week proposed to J. N. Greenshields, chairman of the organization committee of the Home Guards, the formation of such a corps in the province of Quebec. A number of owners of Montreal already have offered the use of their cars, and have also promised to equip them with machine guns, ammunition or medical apparatus. It is thought that with a thousand cars, the Home Guard could be transferred rapidly to any point at which the enemy might appear in force, especially should a raid be attempted from across the border.

Road Funds Not Affected—The fact that the so-called force clause of the Wisconsin highway act has been declared unconstitutional by the state supreme court will not reduce the amount of state aid distributed under the act for the year 1915. The state highway commission has completed its allotment of state funds. Applications for state aid made by the various counties called for approximately \$1,350,000 in state aid, but before the distribution was made the court held the force clause illegal, and the valid applications for state aid were found to be \$1,206,221, deducting requests for state aid initiated under the force clause. The commission, however, has made the allotment of the full \$1,350,000, explaining that this is made possible by the fact that the state highway appropriation for 1915 remains at \$1,250,000 under the act of the 1913 legislature, while \$1,000,000 is provided by direct

taxation; \$200,000 from the general fund and about \$50,000 as the road fund's share of the registry fees.

Aim to Build Concrete Road—An organization has been effected with the ultimate purpose of constructing a 30-mile concrete road from Graand Haven to Grand Rapids, Mich. The association is known as the Grand Haven Highway Improvement Association, and has the following officers: Dr. C. P. Brown, Spring Lake, president; David M. Cline, vice-president; C. E. W. M. Connelly, Spring Lake, secretary; Alvah W. Brown, Grand Rapids, W. N. Loutit, Grand Haven, and William Savidge, Spring Lake, directors.

Raise Ferry Rates on Motor Cars—Motorists are now compelled to pay an increase in ferryage rates on the Pennsylvania railroad ferries between Philadelphia and Camden. This went into effect on November 17. The new rate for cars is 25 cents, which entitles four persons to ride in the car, and for each additional passenger riding in the machine ferry ticket sellers will collect an additional 3 cents. Under the old rate a flat charge of 25 cents was collected for each motor car carried between the two cities.

Seattle Club Elects Officers—At the annual meeting of the Automobile Club of Seattle, held recently, the following officers were elected: President, Joseph Blethen; vice-president, R. L. Sparger; secretary, Frank M. Fretwell; treasurer, W. A. Avery; trustees, Norman B. Abrams, Clyde L. Morris and John W. Roberts. The year just ended was the most successful since the club was organized 7 years ago. Its membership has been increased until it now has 700 names on its rolls, and it has progressed financially. The club has taken an active part in good roads matters, spending several thousand dollars in erecting guide posts on the main traveled highways of western Washington. It gave financial assistance

to the campaign against the obnoxious convict labor law, that was voted upon and decisively defeated November 3.

Hoosiers Building Concrete Roads—The county commissioners at Noblesville, Ind., will build 3 miles of concrete road at a cost of \$53,000. The right of way be 60 feet wide, the grade 26 feet wide and the concrete paving 16 feet wide. A board of reviewers has recommended that the road be built. It will run south from the south city limits of Noblesville.

Wants War Prisoners to Work on Road—That aliens of German nationality, who are to be held as prisoners of war in Canada, should be put to work breaking stones or doing other things necessary for building good roads was the suggestion made to General Hughes by an Ottawa delegation representing the Motor Association recently. The suggestion was favorably received, but a definite answer was not given.

Madison Good Roads Club Elects—John S. Donald, secretary of state of Wisconsin, in charge of motor registry, has been elected president of the recently organized Madison Good Roads Club, an organization of motorists that intends to promote the permanent improvement and maintenance of the highways in the lake region of which Madison is the center. C. F. Allen, of Middleton, has been elected vice-president, and A. E. Austin, of Madison, secretary and treasurer.

Canadians Plan Peace Memorial Road—Although peace may be a long way off, there is a movement in Ontario at this time to take advantage of the end of the war and mark the era to follow by a Peace Memorial highway, stretching across the province from Windsor to Montreal. Details so far have not been worked out, but the idea in the minds of the promoters is to obtain the co-operation of the large centres, municipal bodies and the organized motorists of the province to finance the scheme. It is estimated that the highway will cost about \$6,000,000. Excepting sections of road like the Toronto-Hamilton highway, the mileage outside of the urban districts is estimated at 375 miles and towards the cost of this portion it is hoped that the smaller municipalities and the motorists will contribute.

Solve Parking Problem in Hartford—Because of traffic restrictions of Hartford, Conn., which limit the time cars may be left on certain streets in the business section to 40 minutes, the board of governors of the Automobile Club of Hartford have found it necessary to devise some plan to care for members of the club. Accordingly the governors have entered into an arrangement with the Ashwell Service Station, a commodious structure in the heart of the city, whereby club members may put up their cars during the idle periods for a nominal sum. The governors have issued coupon books, containing twenty coupons, which sell for \$5. Each coupon, which represents 25 cents, is accepted by the service station at face value for day or night storage or for general garage service, such as washing, polishing, storing and the like. For one of these coupons, any member of the Automobile Club of Hartford may place his car in the service station and leave it there for 12 hours continuously, either day or night. The member furthermore may remove his car and bring it back to the garage as often as he desires during the 12-hour period for this one coupon.

Coming Motor Events

SHOWS AND CONVENTIONS

January 2-9—New York show.
January 8-14—Show, Milwaukee, Wis.
January 9-16—Philadelphia show.
January 11-16—Show, Buffalo, N. Y.
January 16-23—Show, Cleveland, O.
January 18-23—Show, Rochester, N. Y.
January 23-30—Chicago show.
January 23-30—Montreal show.
January 30-February 6—Minneapolis show.
February 15-20—Show, Omaha, Neb.
February 15-21—Show, Grand Rapids, Mich.
February 8-15—Show, Kansas City, Mo.
February 23-27—Show, Ft. Dodge, Ia.
February—Show, Portland, Ore.
February—Show, Toledo, O.
February—Show, Hartford, Conn.
March 6-13—Show, Boston, Mass.
March 8-13—Show, Des Moines, Ia.

CONTESTS

*November 26—Corona road race, Corona, Cal.
December 30-January 2—El Paso-San Diego road race.
*February 22—Vanderbilt cup race, San Francisco, Cal.
*February 27—Grand prize road race, San Francisco, Cal.
*May 29—500-mile speedway race, Indianapolis, Ind.

*Sanctioned by A. A. A.



Among the Makers and Dealers



TRUCK MANUFACTURER Changes Name—The Bowling Green Motor Car Co. has changed its name to the Bowling Green Motor Truck Co.

Garford Reduces Capital Stock—Papers have been filed with the secretary of state reducing the capital stock of the Garford Co., Cleveland, O., from \$1,500,000 to \$750,000.

Studying Army Trucks in England—C. B. Rose, chief engineer of the Velie Motor Vehicle Co., Moline, Ill., is now at the Hotel Cecil, London, England, investigating the truck industry in army circles.

Rapid Motor Vehicle Dissolves—A majority of the members of the board of directors of the General Motors Truck Co. has filed a formal notice of dissolution of the Rapid Motor Vehicle Co., Pontiac, Mich.

Receiver for Irvin Mfg. Co.—Judge A. B. Anderson of the United States court at Indianapolis has appointed the Fletcher Savings and Trust Co. receiver for the R. J. Irvin Mfg. Co. of that city. The company manufactures motor car bodies and tops and has been in business several years. The plaintiff in the receivership suit was the F. S. Carr Co., Boston, Mass.

Pierce-Arrow Gets Drawback Allowance—A drawback allowance on the exportation of motor cars and parts manufactured by the Pierce-Arrow Motor Car Co., Buffalo, N. Y., in whole or in part, with the use of imported materials and parts and with the use of parts produced by domestic manufacture in whole or in part from imported materials, has been granted by the treasury department.

Record Year for Long Mfg. Co.—The Long Mfg. Co., maker of radiators, has just ended its fiscal year with a 200 per cent. increase in sales over any previous year. The sales of the months of September and October reached the highest mark in the history of this company. The September production was 300 radiators per day and the specifications for spring delivery have exceeded those of any past season.

New Sales Manager for Saxon—C. F. Jamison, formerly with the Chalmers Motor Co., and until recently sales manager of the Saxon Motor Co., has resigned his position to re-enter business for himself in Lafayette, Ind., where he was for many years a member of the firm of Jamison Bros., one of the largest implement and hardware companies in central Indiana. Lawrence Moore, formerly in charge of the foreign sales department of the Saxon company, is now manager of sales, both domestic and foreign.

Safety First Aids Goodyear Employees—In one year of application, serious accidents at the plant of The Goodyear Tire and Rubber Co., employing 7,500 men, have been reduced 33 per cent by the Safety First movement. Minor injuries to employees have decreased in the same proportion, and employers and employees are enthusiastic over the showing and predict even greater results next year. Every department has its safety rules for its own work and is required to become familiar with them. Much has been done to eliminate individual hazards. The safety engineer has installed dozens of safeguards. Elevator gates are equipped with screens to prevent articles falling down shafts. Trucks and core stands are inspected every week. Slippery floors have been treated and rubber mates are laid wherever helpful. An exhaustive test has proved that rubber heels are a

safeguard against slipping, and heels are furnished the men in many departments. All old-style ladders have been abolished. New ladders have been purchased and equipped with safety shoes. Goggles are furnished men on chipping and grinding operations.

Cozzens with Four Wheel Drive Co.—Fred H. Cozzens, formerly of the International Motors Co. and the Peerless Motor Car Co., has been appointed eastern and foreign sales manager for the Four Wheel Drive Co., of Clintonville, Wis. Mr. Cozzens will have charge of truck sales in the territory east of Pittsburgh and north of Wilmington, N. C., and in addition will look after the foreign business.

Shaw Motor Co. Incorporates—The Shaw Motor Co., Chicago, which recently selected Prairie du Sac, Wis., as the site for its permanent factory, has filed articles of incorporation and a statement to do business in Wisconsin as a foreign corporation. The capital stock is \$1,000,000 and the Wisconsin interest is given at \$30,000. Contracts were awarded late last week for the machine shop, office and assembling building. In addition, the company has the use of the former Kahn foundry for producing its light castings. For the present the heavier castings will be pur-

chased on contract, but ultimately a large foundry will be established. It is hoped to start operations by February 1, 1915.

Rauch & Lang Increase Capital—Papers have been filed with the secretary of state increasing the capital of the Rauch & Lang Electric Car Co., Cleveland, O., from \$10,000 to \$25,000.

Hawaii Orders 30 Signal Trucks—The Signal Motor Truck Co., Detroit, Mich., announces the receipt of an order for thirty signal trucks to be shipped to Honolulu, Hawaiian Islands.

Weaver Leaves Haynes Company—H. G. Weaver has resigned his position as publicity manager of the Haynes Automobile Co. to become sales manager of the Newell Motor Car Co., of St. Louis.

Cadillac Engineer for Canadian Company—R. F. Jack has been appointed chief engineer of the Russell Motor Car Co., Ltd., Toronto, Can. Mr. Jack comes from the Cadillac Motor Car Co., Detroit, where he was assistant chief engineer.

Disco Sales Company Formed—The National Electric Starter Co., Detroit, Mich., which has been organized and incorporated with a capital stock of \$1,000, is a selling organization formed to market a starter for Ford cars, which will be manufactured by the Disco Electric Starter Co.

Lansdale Krit General Manager—The Krit Motor Car Co. announces the appointment of H. L. Lansdale, until recently sales manager of the company, to the position of general manager. H. H. Crawford, who has been general manager since September, 1913, when the Krit company was re-organized, has resigned.

Interested in New Cyclecar—The Circleville Automobile Co., of Circleville, O., is interested in the organization of a company for the manufacture of a new cycle-motor, invented by W. Lee Crouch, of Lancaster, O. It is proposed to manufacture a small car with self-starter and electric lights, to be sold at \$425.

Willys-Overland Plans Additions—The Willys-Overland Co. announces that it will start at once the erection of two large additional buildings, which will make the plant one of the largest factories in the world. One of the buildings will be two stories high, 200 by 1,000 feet, and the other 200 feet square and the same height.

Miller Rubber Earns 10 Per Cent.—Stockholders of the Miller Rubber Co. last week re-elected the retiring officers. General Manager W. F. Pfeiffer's report showed sales for the past year exceeding \$2,500,000. The net profits amounted to \$528,000, sufficient to pay 7 per cent. on the preferred and 10 per cent. on the common stock, and allowing for depreciation on buildings, machinery and tools and crude and finished products.

Gramm Production in One Model—Announcement is made by the Willys-Overland company that in the future the company will manufacture at the Gramm plant in Lima only 1,350-pound delivery wagons. The force will be increased to an extent where five of the delivery wagons will be turned out daily. John N. Willys, head of the company, recently deposited \$100,000 in the Lima banks to take care of obligations against the Gramm plant, assumed when purchased from the former company several years ago. This was done in order to ease the money market of Lima.

Recent Incorporations

Albany, N. Y.—Farm Tractor Sales Co., to deal in motor driven farm implements; capital stock, \$1,000; incorporators, V. E. Consalus, E. W. Sanford, S. C. Turkenkoph.

Boston, Mass.—Percy Ford Co., capital stock, \$5,000; motor car business; incorporators, J. J. Conway, P. Ford, M. F. O'Neill.

Boston, Mass.—Henshaw Motor Co., capital stock, \$25,000; incorporators, C. S. Henshaw, H. I. A. Hodgdon.

Boston, Mass.—Motor Sales Co., capital stock, \$50,000; to manufacture motor cars; incorporators, A. L. West, R. F. Tift, W. J. Cronin.

Brooklyn, N. Y.—Jack London Motor Car Service; capital stock, \$500; incorporators, H. L. Delatour, L. M. Denham, R. H. Sternberg.

Cincinnati, O.—Ford Supply Shop Co., capital stock, \$5,000; to manufacture and deal in motor cars; incorporators, W. Pursell, Bruce Schoolfield, A. W. Kops, H. N. Smith, T. J. O'Neill.

Cleveland, O.—Ford Tire & Tube Co., capital stock, \$10,000; to manufacture tires; incorporators, E. E. Rodd, C. V. Liggett, U. L. Henry, C. A. Levy, L. Ulmer.

Columbus, O.—Remington Auto Sales Co., capital stock, \$10,000; to deal in motor cars and conduct garage; incorporators, C. M. Shira, O. Thacker, W. A. Jackson, W. R. Penrose, G. H. Mosier.

Hartford, Conn.—Charter Oak Motor Car Co., capital stock, \$20,000; incorporators, Frank Zimmerman, E. H. Harris, F. W. Lycett.

Ironton, O.—Ironton Garage Co., capital stock, \$10,000; to deal in accessories; incorporators, R. W. Rowland, I. L. Riley, T. N. Erskine, W. R. Edwards, A. C. Robinson.

Jackson, Mich.—Perfection Coil Spring Co., capital stock, \$20,000; to manufacture coil springs; incorporators, F. J. Foill, B. T. Sims, R. W. Foill, W. G. Lane.

Middletown, O.—C. C. Fouts Co., capital stock, \$75,000; to make metal garages; incorporators, C. C. Foster, C. B. Oglesby, P. Fouts, A. A. Amler.

Moline, Ill.—Hager & Rank Automobile Co., capital stock, \$5,000; incorporators, Robert Rank, Fred Rank, George Hager, A. Sorling.

New York—Cycle Car Sales and Service Corp., capital stock, \$2,400; incorporators, Wm. Vaughan, M. Metzger, H. Whaley.

New York—Gibney Tire & Rubber Co., capital stock, \$100,000; incorporators, F. Netschert, J. Dunsmuir.

New York—Cochran's Garage, capital stock, \$1,000; incorporators, J. Spalla, L. Spalla, J. Spalla.

New York—X Protective Tire Co., capital stock, \$20,000; to manufacture tire protectors; incorporators, I. Neustaedter, H. J. Rosenbloom, A. Alexander.



Brief Business Announcements



WILLIAMSTON, MICH.—The Wilcox & Howe garage has been purchased by John Beach.

Lapeer, Mich.—The Lapeer garage has been sold to C. E. England by Harold Tinker.

Lansing, Mich.—G. A. House has been appointed manager of sales of the Auto Wheel Co.

Royal Oak, Mich.—A garage has been opened on Woodward avenue by F. Austin and E. Watch.

Onaway, Mich.—Myron Gillett and Ellis Wright have purchased the City garage, formerly conducted by A. J. Dunsmore & Son.

Ashland, O.—Lemon Greenwald, of this city, has been made manager of a branch of the Firestone Tire and Rubber Co. to be opened at Santiago, Porto Rico.

Newark, O.—Charles Smith, formerly manager of the Newark Lumber Co., has resigned his position to become general manager of the Blair Auto Truck Co., of Newark.

Detroit, Mich.—The Regal Motor Car Co. has appointed C. K. Paxson, formerly general sales manager of the Ohio Motor Car Co., Cincinnati, O., as one of its special sales representatives.

Philadelphia, Pa.—The corporate title of the Meeley Rubber Co., Inc., has been changed to the Globe Tire and Rubber Co., eastern distributor of the Globe tire. Officials of the new organization are F. W. Darlington, president; J. V. Harrigan, vice-

president, and R. J. Skilton, secretary and treasurer.

Coleman, Mich.—Frank Beck, of Midland, and Robert Jackson, of Yale, have opened a garage at Sixth and Washington streets.

Columbus, O.—The Lee Tire Sales Co. is the name of a new concern, organized by F. P. Corbett, at 246 North Fourth street, to handle Lee tires.

Saginaw, Mich.—J. P. Beck, with headquarters at 815 Genesee avenue, has secured the agency for the Kelly-Springfield and Pullman tires for forty-two counties in Michigan.

Mendon, Mich.—M. C. Flewelin, owner of the Portage street garage building, will start a general motor car business in this building. The former occupant, Kilne & Bowman, has moved into its new garage on Main street.

Dayton, O.—W. L. Marshall, formerly the Xenia agent for the Studebaker, has become factory representative for the Interstate company and will cover ten counties in southwestern Ohio. The new distributing firm will be located at Dayton and will be known as the Twyman Motor Car Co.

Spokane, Wash.—C. S. Mantell, who for several years has been an owner of the Wenatchee Motor Car Co., has become associated with the Western Motor Car Co., of Spokane, Wash., inland Empire distributor of the Paige-Detroit and Locomobile. Mr. Mantell is president of the Chelan County Automobile Club and will retain his interest in the Wenatchee company.

The latter company has taken the agency for the Paige in Wenatchee territory.

Grand Rapids, Mich.—P. C. Dahstra has opened a garage and repair shop at College avenue and Worden street.

Toledo, O.—The Milburn Wagon Co. announces the appointment of R. W. Knowles as assistant engineer of its electric vehicle department.

Philadelphia, Pa.—The Manufacturers' Supplies Co., 1336 Race street, has taken over the distribution of the Racine tire for Pennsylvania, New Jersey and the southern states. Charles A. Wigmore is manager of the company.

Spokane, Wash.—George Woodward, for the past 2 years connected with the mechanical department of the Eastman Motor Car Co., now is associated with A. F. Smith in the Metropolitan garage. The firm name of the new company is the Smith and Woodward Motor Car Co.

Seattle, Wash.—G. Gray Lemley, for 2 years purchasing agent and treasurer of the accessory firm of Ballou & Wright, has been named manager of the Seattle store of the company, succeeding A. H. Jones, who has retired to devote his time to developing a new non-skid tire.

Los Angeles, Cal.—A new firm has opened for business here under the name of Gates & Robinson, A. S. Robinson, formerly manager of the Kissel Kar branch, and W. O. Gates, a pioneer in the motor car business. The firm is to make a specialty of buying, selling and exchanging used Ford cars.

Recent Agencies Appointed by Motor Car Manufacturers

PASSENGER CARS			
Town	Agent	Make	Make
Ada, O.	Stample & Smith	Franklin	
Aledo, Ill.	J. L. Buckley	Moon	
Ashland, O.	Curry & Roberts	Oldsmobile	
Ashville, O.	C. F. Brinker	Studebaker	
Buffalo, N. Y.	Thurston Auto Garage	Krit	
Bloomington, Ill.	Trott & Stubblefield	Oldsmobile	
Bronson, Mich.	Carl & Holcomb	Buick	
Bucyrus, O.	Kisselkar Co.	Kisselkar	
Bloomfield, Ia.	Bruce & Bonar	Moon	
Binghamton, N. Y.	Binghamton Motor Car Co.	Moon	
Barry, Ill.	H. M. Royalty Co.	Moon	
Grand Rapids, Mich.	Security Auto Sales Co.	Franklin	
Caledonia, Mich.	Roy Dodge	Studebaker	
Chattanooga, Tenn.	J. H. Alday	Franklin	
Calumet, Mich.	Weider Harness Co.	Imperial	
Calumet, Mich.	Weider Harness Co.	Empire	
Cardington, O.	L. W. Fawcett	Krit	
Columbus, O.	W. W. Muzzy	Oldsmobile	
Columbus, O.	Buckingham Auto Co.	Krit	
Cedarville, O.	Nagley Brothers	Allen	
Conneaut, O.	Clarence E. Laizure	Oldsmobile	
Clarington, O.	Clarington Auto Co.	Allen	
Des Moines, Ia.	Iowa Oldsmobile Co.	Oldsmobile	
Dayton, O.	Kenneth & Ham Motor Car Co.	Allen	
Ellensburg, Wash.	Ellensburg Automobile Co.	Buick	
Ellensburg, Wash.	Ellensburg Automobile Co.	Ford	
El Paso, Tex.	Oakland Auto Co.	Franklin	
Freeport, Ill.	Maurer Brothers	Oldsmobile	
Freeburg, Ill.	H. Heiligenstein	Moon	
Grand Rapids, Mich.	G. P. Dowling	Cadillac	
Grand Rapids, Mich.	Palmer Sales Co.	Paige	
Hopkinsville, Ky.	Hopkinsville Cadillac Co.	Oldsmobile	
Hoquiam, Wash.	Hoquiam Automobile Co.	Dodge	
Hanford, Cal.	Marak & Hayes	Oldsmobile	
Jennings, Kan.	Smith & Feely	Oldsmobile	
Logan, O.	C. W. Stallsmith	Allen	
Lancaster, O.	Bowman & Bookman	Allen	
Ludington, Mich.	Ludington Auto & Supply Co.	Oldsmobile	
Lorain, O.	Lorain Electric & Auto Co.	Buick	
Miamisburg, O.	Wilbur C. Swartsel	Oldsmobile	
Maysville, Ky.	J. D. Keith	Oldsmobile	
Mason City, Ia.	R. V. Harris Auto Co.	Moon	
Mt. Vernon, O.	Spindler & Hunt	Allen	
Miami, Fla.	S. M. Tatum	McFarlan	
Milton, Ia.	Moon Auto Co.	Moon	
Malta, Mont.	Shody & LeVesconte	Franklin	
Merigold, Miss.	Guy E. Waldrop	Oldsmobile	
Norfolk, Neb.	E. A. Harms	Oldsmobile	
New Paris, O.	C. H. Barton	Allen	
Ogden, Utah	L. P. Wright	Oldsmobile	
Pampa, Tex.	D. B. Stribling	Oldsmobile	
Philadelphia, Pa.	Sterling Motor Car Co.	Jeffery	
Philadelphia, Pa.	Fanning Motor Car Co.	Marmon	
Polo, Ill.	John T. Mulnix, Jr.	Oldsmobile	
Radnor, O.	A. S. Secrest	Krit	
Robinson, Ill.	George M. Allison	Moon	
Bristol, Conn.	L. B. Snyder	Moon	
Rialto, Cal.	B. Buxton	Moon	
Regina, Sask.	Store & Co.	Franklin	
Rushsylvania, O.	Samuel G. Hertz	Krit	
Springfield, O.	Nash-Baird Motor Car Co.	Allen	
Stamford, Conn.	H. R. Hendrie	Moon	
St. Joseph, Mo.	J. A. Suddarth & Co.	Moon	
St. Joseph, Mo.	Grand Center Motor Co.	Imperial	
St. Joseph, Mo.	Leslie Motor Car Co.	Briscoe	
San Francisco, Cal.	Latham-Davis Co.	Stutz	
San Pedro, Cal.	Pacific Garage	Moon	
Trenton, N. J.	Richards & Sykes	Franklin	
Tiffin, O.	C. L. Fifer & Co.	Oldsmobile	
Thurston, O.	C. C. & D. F. Coonfare	Krit	
Ventura, Cal.	C. H. Judd	Moon	
Warsaw, N. Y.	A. F. Mills	Oldsmobile	
Wilkes-Barre, Pa.	Harry M. Ransom	Oldsmobile	
Walla Walla, Wash.	Wood & Lane	Cadillac	
Zanesville, O.	Central Garage Co.	Jeffrey	
Zanesville, O.	Central Garage Co.	Detroit	



Specifications

COLOR—Body, blue black; chassis, etc., black; wheels, scarlet lake.	
SEATING CAPACITY	Three persons
CLUTCH	Cone
WHEELBASE	110 inches
GAUGES	40, 56 and 60 inches
TIRE DIMENSION	Front, 30x3½ inches; rear, 30x3½ inches
BRAKE SYSTEMS—Contracting and expanding on both rear wheels	
HORSE-POWER	N. A. C. C. (formerly A. L. A. M.) rating 13.25
CYLINDERS	Four
ARRANGED	Vertically, under hood
CAST	En bloc
BORE	2⅞ inches
STROKE	4 inches
COOLING	Water
RADIATOR	Cellular
IGNITION	Jump spark
ELECTRIC SOURCE	Generator and storage battery
DRIVE	Shaft
TRANSMISSION	Selective sliding gear
GEAR CHANGES	Three forward, one reverse
POSITION OF DRIVER	Left side drive and center control

ROADSTER - Completely equipped, price \$775 F. O. B. Detroit
 Price includes wire wheels, top, top hood, electric lighting, electric self-starter, spare wire wheel, extra tire with tube, windshield, speedometer, electric horn, etc.

Betterments

BODY—Streamline, torpedo stern, wide door, Cowl dash instruments: sight feed oiler, lighting and dimming switches, starting strangler, ignition switch, flush speedometer, shroud light.
UPHOLSTERY—Highest quality, long grain, buffed, REAL leather, Turkish tufted, nine inch cushions.
RADIATOR - V type, German silver
WHEELS—Five Houk triple laced detachable, wire, 30x3½ inches, with wide hubs.
MOTOR—Sterling, valve-in-head, high speed type, unit with gear set. Circulating splash oiling with sight feed on cowl dash.
CARBURETOR - Zenith with hot air intake
IGNITION—Atwater-Kent automatic spark advance connected with starting system.
STARTING—Bijur electric single unit starter generator connected by silent chain.
AXLES—All bearings annular. Rear axle, full floating; front I-beam drop forged.
SPRINGS—Front, semi-elliptic with overslung frame; rear, full cantilever.
TIRES - Five Goodrich, 30x3½, non-skid
FENDERS - Crowned, running boards linoleum covered
CONTROL—16" steering wheel, polished aluminum spider, 3" Klaxet button in center, with hand throttle. Foot accelerator, center gearset lever. Left pedal controls clutch and brake.
LIGHTING—Two bulb dimmer head lights with lens doors, tail light, and shroud light.
FEATURES—Electric door lock, silk mohair top with side curtains, rain vision plate glass windshield, full tool equipment and jack.

No better specifications are found in any car at any price; yet these are the features of the new **SCRIPPS-BOOTH** 1500-pound roadster, the first light car in America reproducing in finish, art lines, mechanical excellence and riding comfort, the refinement and luxury of the world's best cars.

SCRIPPS-BOOTH COMPANY, DETROIT

When Writing to Advertisers, Please Mention Motor Age.

SCHEBLER WINS

Los Angeles-Phoenix Road Race

THE



OLDFIELD

In the fiercest contest of the kind ever staged—with 696 miles of mechanism-shattering roads, with mountain slopes, deep sand, rain, sleet and cold, all putting the carburetor to a supreme test of efficiency—Barney Oldfield drove his SCHEBLER-Equipped Stutz to victory and the title "Master Driver of the World."



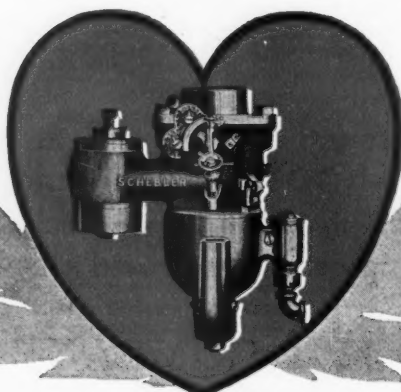
NIKRENT

Louis Nikrent, in a SCHEBLER-Equipped Paige, took 2d honors.

SCHEBLER met perfectly every variation of altitude and temperature. It fought doggedly along through deep desert sand and roads swimming with mud. It enabled Oldfield to hit it up to seventy miles per hour where the going permitted. It developed the necessary "drive" for carrying the car up the stiffest mountain grades. Never was SCHEBLER'S claim to mastery over all-round service conditions more eloquently proven.

WHEELER & SCHEBLER

Indianapolis, Indiana

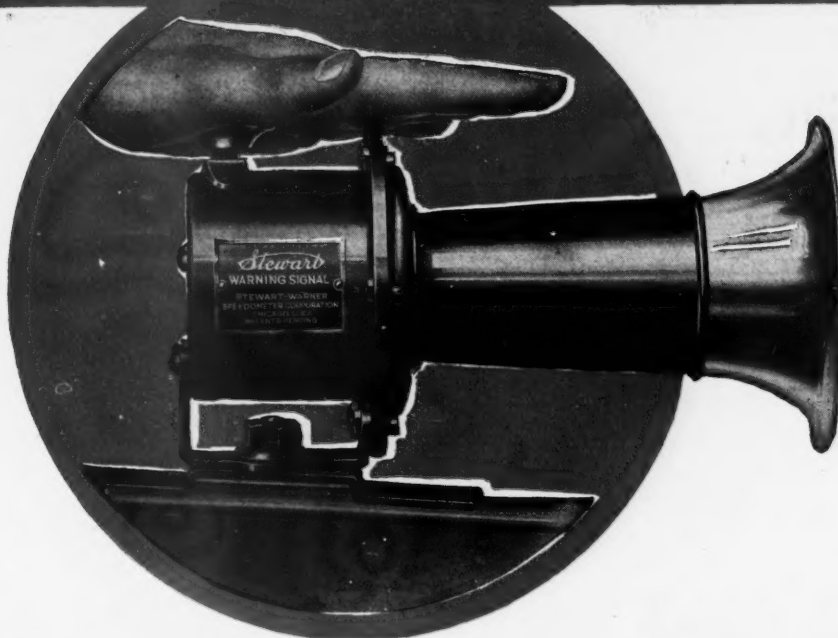


THREE

VICTORS

Another Big Stewart Success!

\$5



A New Warning Signal at the Right Price

STEWART SUCCESS is a by-word in the automobile industry.

The Stewart Speedometer is used on over 95% of the cars. Over 1,300,000 are used today.

The Stewart Vacuum Gasoline System marketed only 6 months ago has already been adopted as standard equipment on nearly 25% of the cars.

The Stewart Tire Pump is now the most popular pump on the market.

Now comes the Stewart Warning Signal.

Immediately the trade heard of this Warning Signal, orders were placed by the thousands and this was before they even saw a model.

But they knew that this warning signal would be another big Stewart success.

We were the first to price a hand operated warning signal at the *right* price of \$5—as usual others followed.

The Stewart is the handsomest warning signal ever produced—an ornament to the highest priced car, beautifully finished in black and nickel or black and brass.

It is the easiest to operate. The slightest touch of hand or elbow sounds the warning—clear, loud, long and penetrating.

This hand operated warning signal wastes no battery power, so important now to conserve for starting and lighting.

The gear train on which the success of the warning signal depends, has been designed to give everlasting service. The gears, cut from the highest grade steel, **not stamped**, are wide faced and case hardened. They are mounted in hardened steel bushings and are carried in a frame with each gear mounted in double bearings, which insures absolute alignment, ease of operation and eliminates the wear so common with a bearing supported at one end only.

The projector (or horn) is made of high quality brass. Both projector and bell shaped end are formed in one piece. This is much more costly than the usual two piece steel projector. But this method gives infinitely better sound producing qualities.

The diaphragm is of the best Swedish steel.

Double bracket, instead of single bracket, prevents wobbling and holds this signal rigidly and in correct position. It cannot rattle. Our double bracket support *swivels* on a lower bracket which is attached to the top rail of the car conforming to its shape. This sends the full warning blast straight ahead down the road. This is an exclusive feature of the Stewart Warning Signal, and alone would make it a success.

Lubrication requires no attention. The Stewart *felt-pad* oilers retain the oil and lubricate properly without waste, nuisance or frequent oiling.

Stewart Warning Signal

Sold on 30 Days
Free Trial

You take no chance when you buy the Stewart. If not satisfied the buyer may return the signal and receive his money back.

Stewart-Warner Speedometer Corporation

Executive Offices: 1993 Diversey Boulevard, Chicago. Factories: Chicago and Beloit, Wis.

17 Branches. 70 Service Stations in all cities and large towns

No Need to Pay More!

GEAR SHIFTING BY ELECTRICITY

The Electric Gear Shift

YOU are no doubt familiar with the ordinary type of horse-shoe magnet, and the peculiar ability it possesses of attracting to itself bits of iron or steel. Early in the study of electricity, physicists found that certain materials could be magnetized permanently, while other materials would only retain their magnetism as long as they remained in a magnetic field; or in other words, in a place where magnetic lines of force were present. As for instance, it was early proven to be a fact, that if a coil of wire be wound around a piece of soft iron, (see Fig. 2) that this iron "core," as it is called, could be made magnetic by passing an electric current through the wire, which surrounded it.

It was also found that when a current was passed through it, the lines of force produced a strong magnetic "field" inside of the coil, and that bits of iron, or an iron bar would be drawn up inside of this coil, whenever the electric current was turned on. (Fig. 3.) The articles attracted would, however, drop out again as soon as the current was turned off, showing that these electric magnetic lines of force were the result of the passing of the electric current through the wire. As soon as the current was turned off the magnetic effect disappeared.

In the light of these facts it will therefore be seen that it is possible, by means of such a coil of wire through which an electric current can be passed, to create a **temporary electro-magnet at will**, and to destroy it with equal ease.

Electro-magnets of this character are used in thousands of machines to perform mechanical operations, which heretofore have been accomplished "by hand." For instance, in the handling of pig iron, large electro-lifting-magnets are now utilized to pick

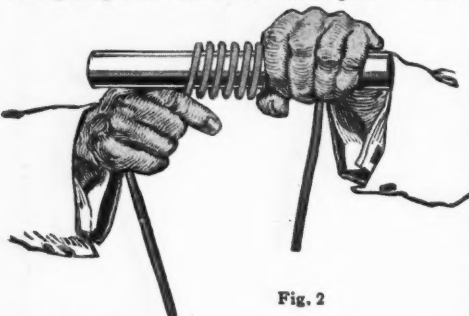
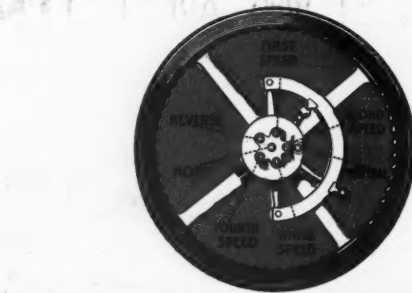


Fig. 2

up the iron and carry it from one place to another, the closing of a switch causing the magnet to instantly attract the



IT is our purpose in these advertisements to explain in detail the construction of the Vulcan Electric Gear Shift, its application to the sliding gear transmission of a motor car, and to point out by means of photographs and drawings its extreme simplicity, showing how, by its application, the control system of a gasoline motor car may be simplified so that even the novice may learn, in a very few moments, to control the most powerful gasoline motor car with ease and safety. While the electro-magnet has been extensively used, for many years, in other forms of control, the absence of a suitable source of electric current has prevented its use on motor cars. With the addition of an electric starting and lighting system, however, the use of an electro-magnetic system of control has been made not only feasible, but simple and convenient. It is now possible, for the first time, to do away with the complications and defects of the manual system of gear shifting, and put in its place a system of control so simple that a woman or child can operate a high power gasoline car, with the same ease as an electric car.

iron to it, the opening of the switch instantly demagnetizing the magnet, and allowing the iron to drop. This principle, which is the same as that used in electric bells, telegraph instruments, and in hundreds of other familiar electric applications has now been applied to the shifting of gears in the automobile transmission. The Vulcan Electric Gear Shift operates on this principle.

Now, if you will refer to diagrammatic sketch 5 you will see that magnets have been substituted for the hand, that the shifting arm may be moved to the right or to the left in the same manner as it was moved by the hand in the mechanical gear shifting device. Referring to Fig. 3, if the current is turned on by closing the switch "S", so it will pass through the wire "D" the plunger "P" will be drawn into this magnet coil. If the electro-magnetic coil or "solenoid" is placed in a horizontal position the same action will take place. (See Fig. 4.) In other words, by substituting for the hand the magnets "B1" and "B3" and providing a switch and a push-button to direct the current as desired, the shifting gear in the transmission may be moved back and forth instantly. In most transmis-

sions there are two gears, which must be moved either to the right or to the left as the case may be, in order to obtain the various speeds required for the successful operation of the motor car.

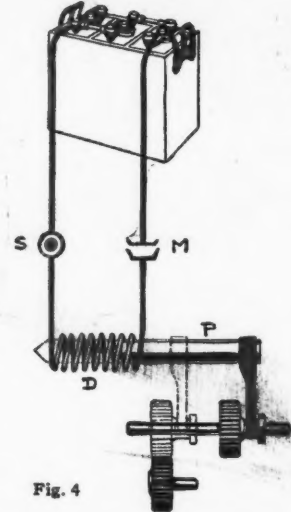


Fig. 4

In order that the driver of the car may control these magnets easily, push buttons are placed on the steering wheel of the automobile, so numbered that any one of the magnets in the shift can be operated at will.

Thus you will see that what was before a rather cumbersome and hard-to-operate mechanism has been reduced

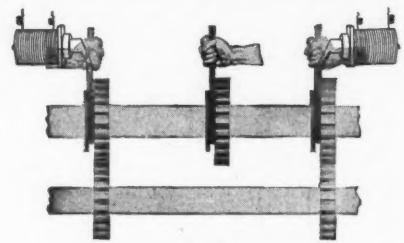


Fig. 5

to a very simple and compact piece of electrical mechanism.

Watch for our next advertisement; it will tell you still more about this wonderful new automobile improvement, or use this coupon to get all details at once.

Our new book "Gear Shifting by Electricity" is one that every automobile enthusiast will enjoy reading.

It is written in a simple, extremely interesting manner and explains in great detail and with wonderful clearness the principles underlying the Electric Gear Shift. We'll be glad to send you a copy if you use this Coupon.

COUPON

Please send me your book "GEAR SHIFTING BY ELECTRICITY."

Name _____

Address _____

"VULCAN ELECTRIC GEAR SHIFT DEPARTMENT"
Cutler-Hammer Mfg. Co.
MILWAUKEE WISCONSIN



EVERY LBA battery is brim full of these energetic little fellows, ready and waiting to answer the touch of a starting or lighting button.

They are faithful in all kinds of weather, for a long time, and all they ask is a drink of distilled water occasionally. They keep the motorist from getting out in the mud to turn a crank; they light his way home at night; and they make a big difference to the manufacturer in the way his car performs when equipped with the LBA.

The LBA has spelled electrical success for the big majority of American Motor Car builders for years by its dependability.

Willard Storage Battery Company Cleveland, Ohio

New York Branch: 228-230 W. 58th St.
Chicago Branch: 2524-30 S. Wabash Ave.

Detroit Branch: 736-740 Woodward Ave.
San Francisco Branch: 821 Monadnock Bldg.

Indianapolis Branch: 318 North Illinois Street

Service Stations in all Principal Cities in the United States, Canada and Mexico



ANOTHER VICTORY

for

The Automobile Supply Manufacturing Co.

Makers of Newtone and Handphone Horns

It has been decided by the Board of Appeals in the United States Patent Office that LONG, the alleged inventor of the device set forth in the "Long Patent" under which the Piel Company claims to be putting out the *Long Horn*, has no right to the **claims** involving the **Fly Wheel Construction** used in all the hand operated Automobile Horns.

The Law Examiner had not only held that Long was **not** entitled to make these claims, but that Aufiero, an inventor for the Automobile Supply Mfg. Co. **WAS** entitled to make them. An appeal was taken by Long and the decision of the Board of Appeal affirms that of the Law Examiner.

It would appear from this decision that the Automobile Supply Mfg. Co. will itself in due course become the owner of a patent covering the fly-wheel construction such as is now used in the construction of the Klaxon Hand Horn, the Long Horn and the Handphone of the Automobile Supply Mfg. Co.

BUSINESS METHODS THAT PAY

A Satisfied Customer Is an Envable Asset in Any Business

The Automobile Supply Mfg. Co. guaranteed and protected all their dealers handling Newtones and bore all expenses and damages caused by the Klaxon suits. The following is a fair sample of the many letters received by our attorneys from the eighteen dealers who had been sued by the Klaxon Co. for handling Newtone Horns.

The expenses of each and every one of these suits have been borne by the Newtone Company and in no instance have the dealers incurred a dollar's expense.

New York, November 11, 1914.

Messrs. Mauro, Cameron, Lewis & Massie,
Woolworth Building,
New York City.

Gentlemen:

We are in receipt of your favor of the 5th inst., enclosing copy of final decree dismissing the bill of complaint in the case of Lovell-McConnell Manufacturing Company against American Auto Supply Company.

We thank you for the interest shown, and we have already expressed our gratitude to the Automobile Supply Manufacturing Company by handling their goods again and will always be glad to give their goods preference and we trust that their expense in going thru this suit will be justly rewarded by the general loyalty of the trade.

Yours very truly,

AMERICAN AUTO SUPPLY CO.

EJK MS

This bears out our statement repeatedly made during the past four years that Newtone Horns were not infringements and that dealers should have no fear of law suits and methods of intimidation.

We have always stood back of our customers, protecting them in every way, and they may rest assured that they will continue to receive the same protection as heretofore.

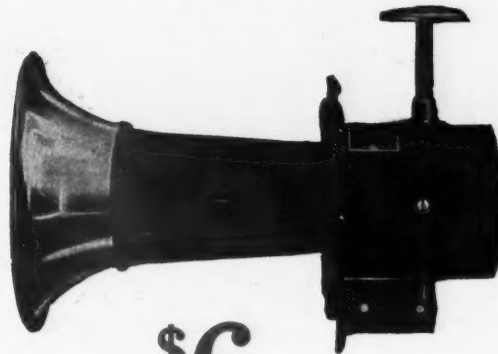
AUTOMOBILE SUPPLY MFG. CO. 220 TAAFFE PLACE
BROOKLYN, NEW YORK

ATTENTION of the TRADE

New Prices Taking Effect December 1st

The Handphone

Guaranteed
for
Three Years



No Adjustments
Motor Troubles

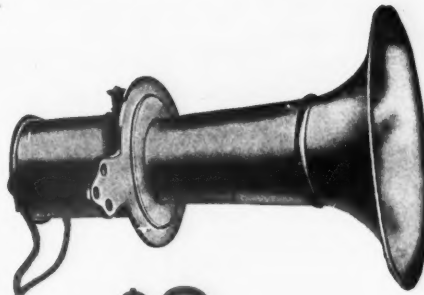
No Electric Wiring
Battery Expense

Price Reduced to **\$6**

With the most advanced methods and automatic machinery, we have made this mechanical Horn the most efficient device of its class. It is easily operated, the pressure is reduced to a minimum, the sound is instantaneous, deep and penetrating. Quantity production enables us to reduce the cost, and we are, therefore, giving the benefit to the trade.

Newtone Superior

The Best Motor-
Driven Horn
At Any Price



Guaranteed for
the Life of
Any Car

Price Reduced to **\$8**

The Motor Driven Horn with a reputation for carrying power with a minimum current consumption (a battery lasting 6 months). The most perfect Motor Horn on the market; 84,317 sold in 1913. Sample sent express prepaid. **Compare** it with others of similar type and "size," and judge for yourself. If it is not superior to any other do not pay for it.

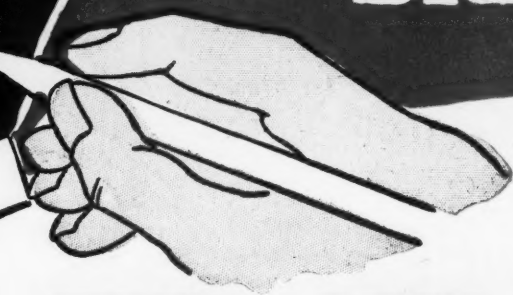
The Best Jobber's Proposition

AUTOMOBILE SUPPLY MFG. CO. 220 TAAFFE PLACE
BROOKLYN, NEW YORK

Rain Water Fuel Test

1030 miles in 20 hrs.
32 minutes. Average
50.2 miles per hr.
Marmon 41
Small Six

More Record
For Your
Black-



THE NEW STROMBERG

The most remarkable fuel trial the world has ever known was completed Friday, November 20th, on the Indianapolis Speedway. A Marmon 41 small six, seven passenger car, fitted with a NEW MODEL STROMBERG CARBURETOR, made 1030 miles in 20 hours and 32 minutes, running the entire distance practically on water. The distance was covered in 18 hours and 24 minutes actual running time, averaging 55.95 miles per hour. The elapsed time was 20 hours and 32 minutes, averaging 52.2 miles.

The run was made with windshield up, carrying driver and mechanic in a temperature of 10 to 20 degrees below freezing, and in the face of a strong raw north-west wind.

Wonderful Carburetor and Fuel Record

The remarkable features of this test were the way the new fuel performed and the splendid way in which the new Stromberg handled it. This fuel is 90 percent rainwater with certain chemicals added. The carburetor was a regular stock model and it operated with the same efficiency as with the highest test gasoline.

Surely this record, considering the extraordinary conditions under which it was made, is proof conclusive of Stromberg superiority.

Official Test

This test, and the one described on the opposite page, is official. Both were made under the direct, personal supervision of Chester S. Ricker, technical representative of the Indianapolis Motor Speedway, and F. E. Edwards, technical representative Contest Board A. A. A.

rd
ur
k-
**Breakers
Mental
board**

62.89 Miles in
60 minutes with
top and wind
shield up carrying
5 passengers
Constant running
Marmon 41
Small
Six

G **DOES IT**

It is a well known and established fact that the new Stromberg is the most economical and efficient carburetor made. Now we have the proof that it is beyond a doubt the speediest carburetor made.

Speed Record Broken

The new Stromberg, in the test described below, shatters completely the general assumption that no stock car would ever be able to make 60 miles per hour constant running.

At Indianapolis, November 14th, the same Marmon Six used in the "rainwater" test, related on the opposite page, with the same Stromberg Carburetor, established the World's Speed Record for stock cars.

With the top and wind shield up this car made 62.89 miles in sixty minutes, carrying five passengers—car and passengers weighing 5310 pounds.

The Stromberg also enabled this car to make records for 10, 20, 30, 40 and 50 mile distances.

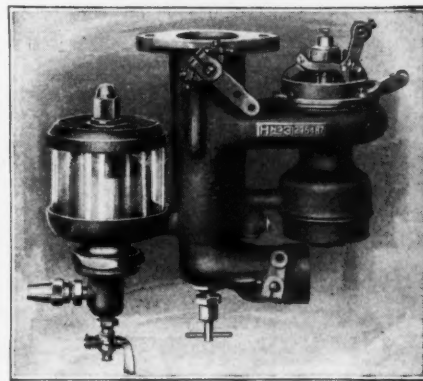
But the main record, remember, was made on sixty minutes constant running. And all of this was done in the teeth of a strong north wind.

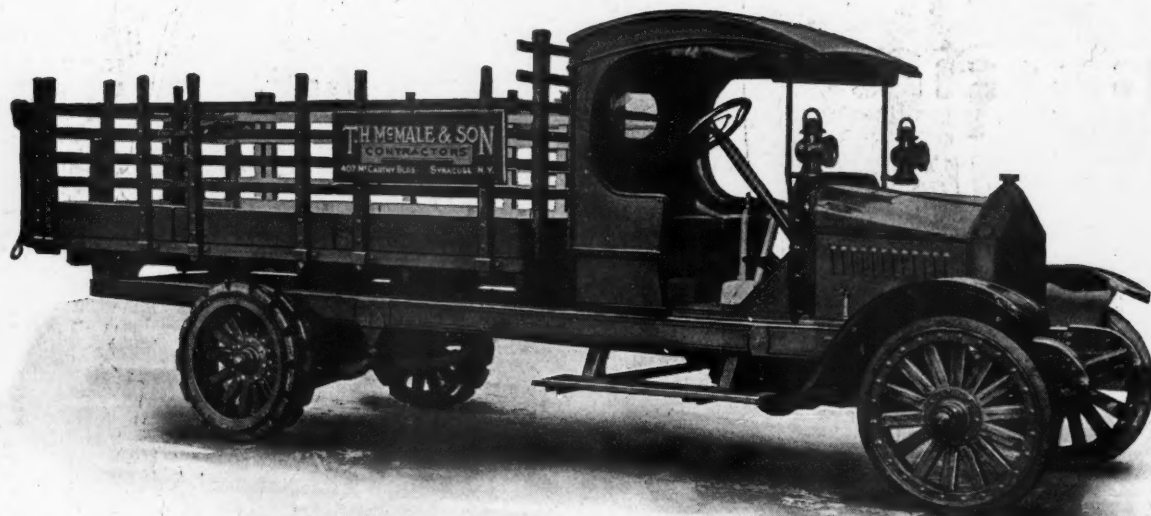
Records such as these point strongly to the advisability of a new model Stromberg for your car—NEW OR OLD.

Send us your name, year and model of your car and we will send you further information regarding new Strombergs and the great world records they are piling up.

ADDRESS

Stromberg Motor Devices Company
64-68 East 25th Street
Chicago, Ill.





One of the new 3-ton
Chase Worm Drive
Trucks in use by a
contracting firm

CHASE

The Worm Drive Line

FOR hard service, for long service, for efficient service, one answer—the *worm-drive*. For the greatest mechanical advantages combined with the greatest mechanical simplicity, one answer—the *worm-drive*.

Chase Engineers offer this ideal motor truck driving mechanism in a complete line of trucks. It is the vital element in our truck efficiency. And every other element is consistent with this *worm-drive* achievement of Chase Engineers.

Continental Motors Brown and Lipe Transmission
Sheldon Worm-Drive Axles, David Brown type. Mounted upon
Imported Annular Ball Bearings.

The Chase 1915 Worm-Drive Line

Three Sizes: 3 Ton, \$3300. 1½ Ton, \$2200 ¾ Ton, \$1500.

Also Two Chase Air-Cooled Models, Known in Every
Country of the World: ¾ Ton, \$1000. ½ Ton, \$750.

CHASE MOTOR TRUCK CO., SYRACUSE, NEW YORK

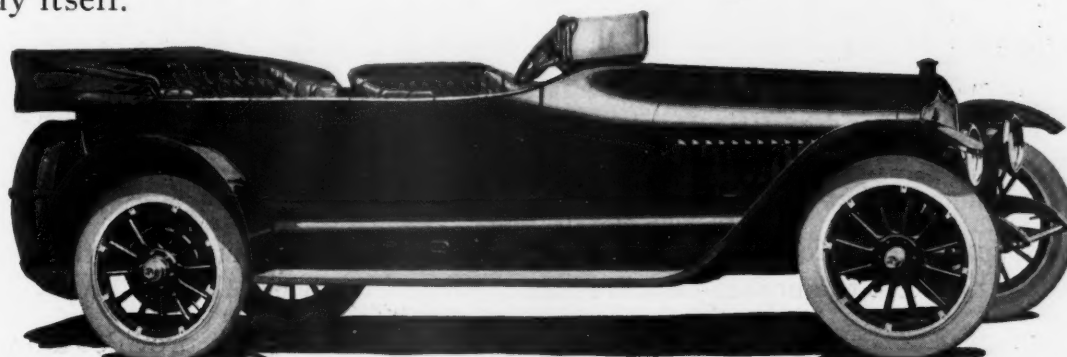


THE *National* Aisle-Way permits passengers to easily change seats. It provides individual "arm chairs" and perfect ventilation for both front and rear seats.

National cars have excelled mechanically for fourteen years, by every known test and demonstration. A fair and liberal policy, extended equally to *National* dealers and owners, has built a reputation as solid as the *National* company itself.

The distinctive beauty and convenience of the new *National* design added to this unimpeachable record of mechanical reliability makes this new *National* the favorite motor carriage of those who show discrimination. From January to November, 1914, *National* Car sales increased forty-one per cent.

\$2375



National, Series AA Six, \$2375—in 2, 4 or 5-Passenger. Six-Passenger, Aisle-Way, \$2500. National Sixes develop any part of 55 H. P. at a fuel efficiency up to 17 miles per gallon.

National Motor Vehicle Company, Indianapolis, Ind.



The clean cut appearance and the impression of balance which Sheldon Worm Gear Axles present indicate to the keener mind a masterpiece of design and construction.

A technical examination of the working components of this type of Sheldon Final Drive invariably substantiates the confidence the assembled unit inspires.

A further analysis of the elements of Sheldon design and construction rounds out your investigations and puts the most skeptical in a receptive frame of mind to learn—

By tests—exhaustive and all-comprehensive—under every conceivable condition of road, load and grade—Sheldon Worm Gear Axles deliver from 94 to 97 per cent of power effort to the rear wheels.

94% of power effort delivered to the driving wheels is a remarkably high degree of efficiency, even for a Worm Gear Rear Axle. Yet the final drive on the Experimental Truck, which Sheldon Engineers use for tests and experimental purposes, shows that efficiency day in and day out, with loads of all kinds, and on roads and grades, every kind of which abound in the hills and mountains in and around Wilkes-Barre, Pa.

With the splendid efficiency of Sheldon Worm Gear Axles in mind, note the way in which the brake drums protect the brakes—double internal on each wheel.

Another feature of Sheldon Final Drive is the arrangement which provides ample clearance for the use of skid chains when traction is poor.

The Sheldon policy of placing the various manufacturing departments under the direct supervision of Sheldon engineers has worked such marked advance in the development and service of Sheldon Springs that the Spring Department has become one of the most important units of the Sheldon organization.

In changing the corporate name of this concern to the Sheldon Axle and Spring Co., we believe we are giving it a more practical name—at the same time doing justice to our Spring Department and to those manufacturers who now equip their cars or trucks with Sheldon Springs.

The Sheldon Axle and Spring Company specializes in the design, development and manufacture of

Worm Gear Rear Axles, Front Axles and Springs for both pleasure cars and all types of commercial vehicles—and

Brake and Radius Rod Equipment for chain drive trucks.

Notice the new corporation name.

THE SHELDON AXLE AND SPRING COMPANY

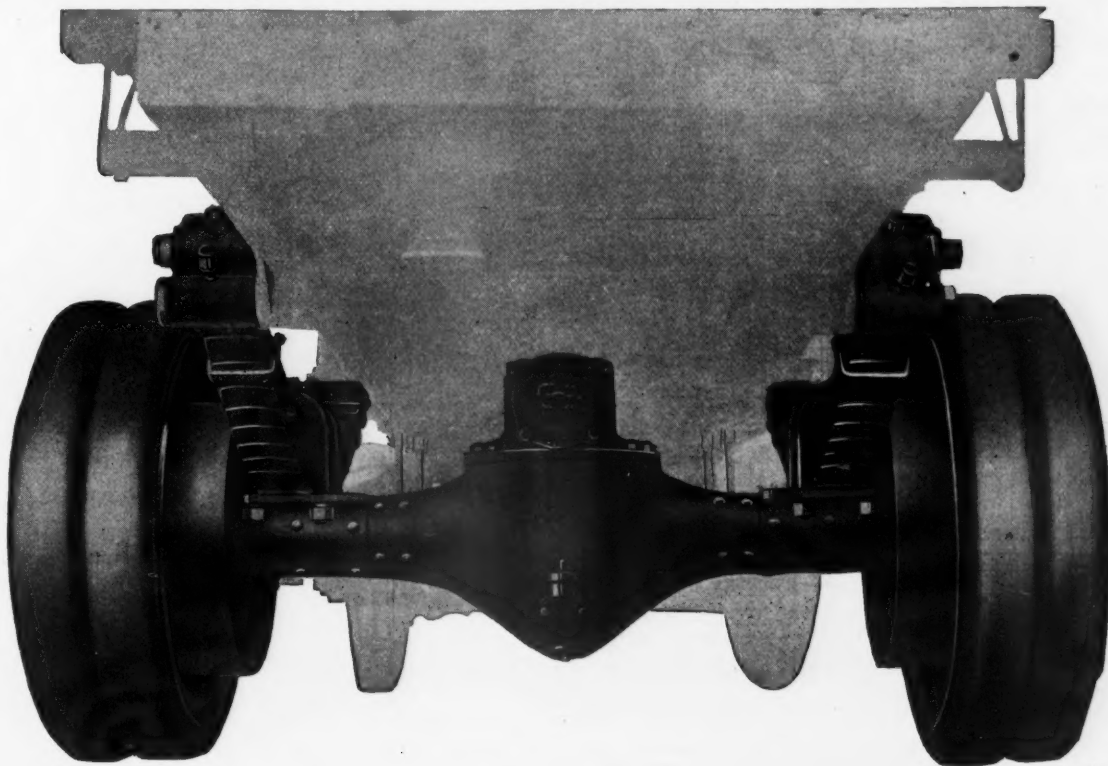
MAKERS OF SPRINGS AND AXLES FOR HEAVY DUTY SERVICE FOR MORE THAN 50 YEARS

WILKES-BARRE, PENNSYLVANIA

Chicago: 122 S. Michigan Blvd.

San Francisco: 444 Market St.

Detroit: 1215 Woodward Ave.



"Have them use the kind with the silver edges"

SO that you may use the same practical discrimination in selecting the brake lining for your car, here are a few paragraphs from brake lining history which tell why we silver both edges of RAYBESTOS and why every foot of it is stamped with our trade mark

TRADE MARK
Raybestos
REG. U.S. PAT. OFF.

Since 1901 we have designed, manufactured and sold automobile brakes and brake mechanisms to many of the foremost American motor car manufacturers.

Many others who manufacture their own brake mechanisms have taken advantage of our experience in a consulting capacity.

In 1905 we conceived and produced the first brake linings made of woven asbestos yarn.

In 1906 we conceived the idea of weaving asbestos yarn with a wire core into brake lining and trade marked this product RAYBESTOS.

We were the first to treat our brake lining with a heat and wear resisting compound. From a surface treatment of this kind we have developed our facilities and for some years past have impregnated the entire thickness of RAYBESTOS with a highly developed heat and wear resisting



compound which as much as anything else is responsible for the superb service this quality brake lining gives.

From the very first we have had what no other brake lining manufacturer today can boast of—a world of experience in the design and manufacture of brakes and brake mechanisms—as the basic knowledge for the development of RAYBESTOS.

RAYBESTOS is a quality product.

To such an extent has RAYBESTOS been copied and so closely has its trade name been imitated that we now silver both edges of it and stamp our trade-mark on every foot of it so that you can distinguish it readily from other brake linings with similar sounding names.

They followed me and they copied me,
But they couldn't copy my mind,
And I left them gasping and floundering,
A year and a half behind.

The Royal Equipment Company

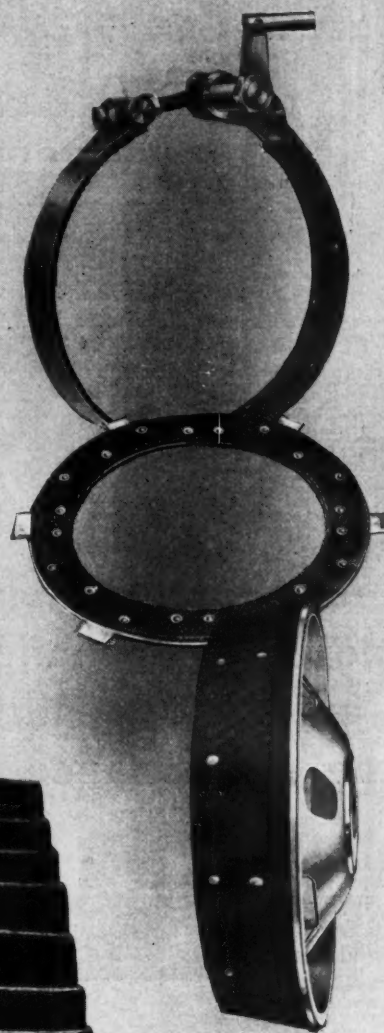
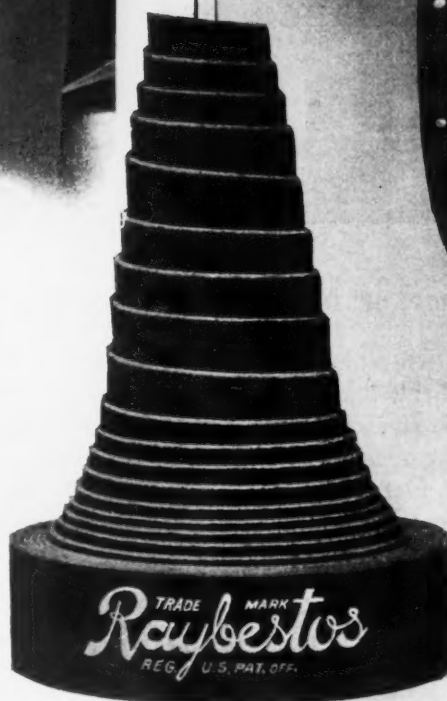
1 3 5 4
Bostwick Ave.



RAYBESTOS is used for brake linings, multiple disc clutch facing and for cone clutch facing. For any of the above purposes its high friction and heat resisting properties, together with its long wearing qualities, have won for it the prestige which is worthy of the consideration of everybody who owns an automobile or who is affiliated with the automobile industry in any way.

Each year sees more and more RAYBESTOS used. Our sales are increasing, our business is growing, our distributors are enlarging their orders and every report indicates that the motorists are getting the best satisfaction from the use of RAYBESTOS.

Bridgeport, Conn.



Form 3500 B.

DAY LETTER

THE WESTERN UNION TELEGRAPH COMPANY

INCORPORATED
25,000 OFFICES IN AMERICA CABLE SERVICE TO ALL THE WORLD

This Company TRANSMITS and DELIVERS messages only on conditions limiting its liability, which have been accepted to by the sender of the following Day Letter. Errors can be guarded against only by requesting a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of Unrepeated Day Letters, sent at reduced rates, beyond a sum equal to the amount paid for transmission; nor in any case beyond the sum of Fifty Dollars, at which, unless otherwise stated below, this message has been valued by the sender thereof, nor in any case where the claim is not presented in writing within sixty days after the message is filed with the Company for transmission. This is an UNREPEATED DAY LETTER, and is delivered by request of the sender, under the conditions named above.

THEO. N. VAIL, PRESIDENT BELVIDERE BROOKS, GENERAL MANAGER

RECEIVED AT NOV 6 - 1914

CONNECTICUT TELEPHONE & ELECTRIC CO.,
MERIDEN, CONN.

AFTER BREAKING SEALS ON 7500 MILE RELIABILITY CAR WE HAVE CLOSELY EXAMINED THE CONNECTICUT IGNITER AND FIND IT IN PERFECT CONDITION. NO SIGNS OF WEAR. THIS EQUIPMENT GAVE SPLENDID SATISFACTION EVERY MILE OF RUN. NOT A MOMENT'S TROUBLE AT ANY TIME. WE ARE FULLY CONVINCED THAT OUR 1915 MODELS ARE EQUIPPED WITH THE BEST IGNITION SYSTEM OBTAINABLE.

PAID MITCHELL-LEWIS MOTOR CO.,
A.C. 5:40 P M

Not a moment's trouble at any time—splendid satisfaction every mile of the run—and at the end—in perfect condition and no signs of wear. Such was the performance of

CONNECTICUT AUTOMATIC IGNITION

on the Mitchell Light Four Reliability Car

Sustained Confidence of Mitchell Engineers in a Supreme Test of Ignition Efficiency

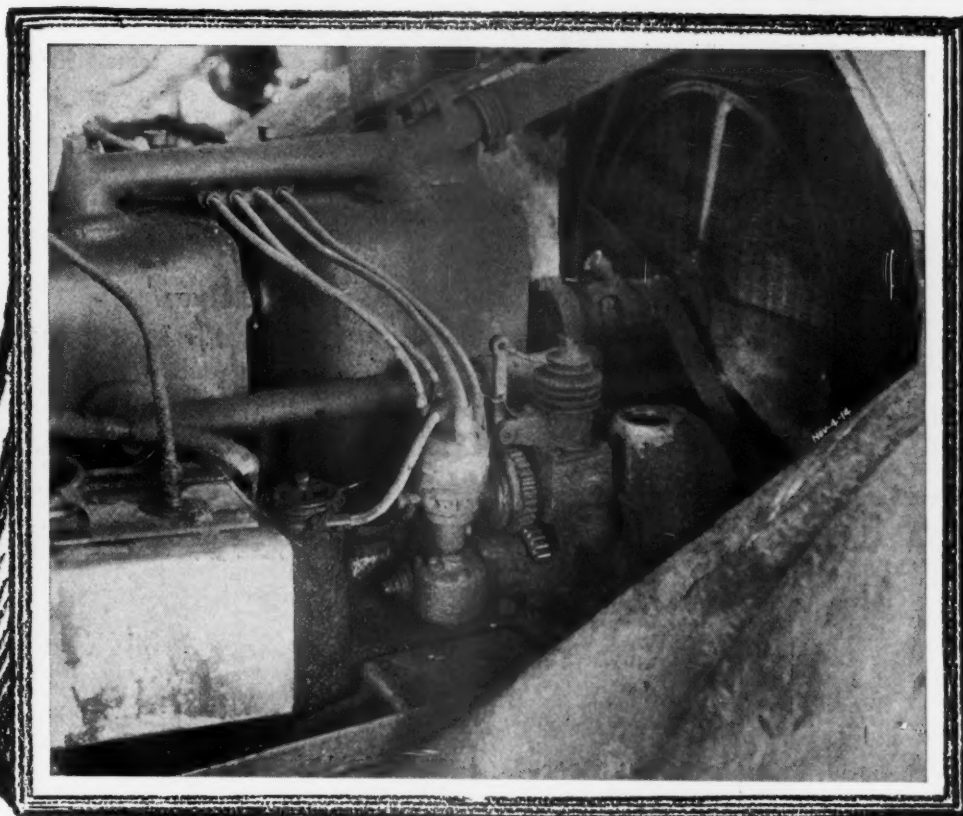
After its bonnet had been sealed by the Chief of the Chicago Police Department, the Mitchell Light Four left that city September 19th, and on its run averaged 250 miles a day for 30 consecutive days. The cities visited indicate its route: Detroit; Cleveland, Youngstown, Ohio; Buffalo, New York; Utica, New York; Nashua, New Hampshire; Manchester, New Hampshire; Portland, Maine; Boston; Providence, Rhode Island; Hartford, Connecticut; New York City; Philadelphia, Pennsylvania; Baltimore; Washington; Cumberland, Maryland; Wheeling, West Virginia; Pittsburgh, Pennsylvania; Dayton, Ohio; Terre Haute, Indiana; Springfield, Illinois; St. Louis; Mexico, Missouri; Kansas City, Missouri; Hiawatha, Kansas; Omaha, Nebraska; Sioux City, Iowa; Minneapolis,

Minn.; La Crosse, Wis.; Baraboo, Wis.; Milwaukee, Wis.; Chicago; Fort Wayne, Lafayette, Indiana, to Pittsburgh, Pa., October 23rd.

The hardest part of the run came in Missouri and Kansas, where 12 days of continuous rains made the roads almost bottomless with mud. One stretch was so bad as to require driving 66 miles on low gear. Otherwise average good roads with such hills, mountains and level going as the route indicates were encountered.

When the seals were broken in Pittsburgh by Mr. F. E. Edwards, Technical Expert of the Contest Board of the American Automobile Association, over 85 pounds of mud and sand were found in the drip pan.

7500 MILES UNDER A SEALED BONNET



Neither the Connecticut Igniter and its Coil nor the high tension wiring suffered in the slightest from the mud and water which must have, at times, been thrown over them in showers.

Mounted under the hood, where no adjustments could be made, it stood up to its work day in and day out, never missing a shot, regardless of the grueling imposed by road conditions or the weather. Not only that, when the motor was dismantled there were only slight indications of carbon on the valves. Mitchell Engineers attribute this to the superlative qualities of CONNECTICUT AUTOMATIC IGNITION.

The photograph reproduced here was taken shortly after the seals locking the bonnet of the Mitchell Light Four were broken. It indicates to some extent the conditions under which the CONNECTICUT AUTOMATIC IGNITER worked. Nevertheless the splendid satisfaction it gave every mile of the run shows that the punishment it received from water, mud and sand had no effect on its efficiency.

THE LESSON

CONNECTICUT AUTOMATIC IGNITION has, in one of the most daring tests ever undertaken, substantiated every claim of efficiency we have made.

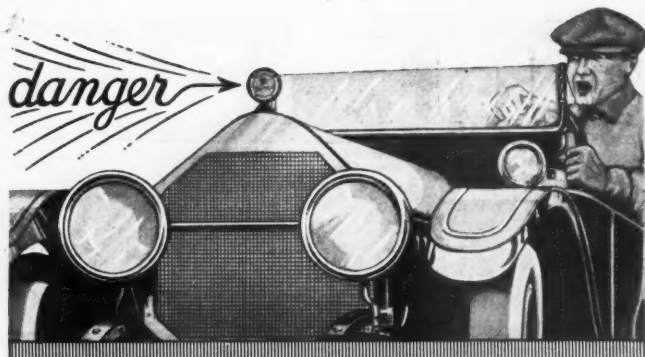
Its performance vindicates the judgment of Mitchell Engineers and others who have adopted it.

The CONNECTICUT AUTOMATIC IGNITION SYSTEM is made for 4, 6, or 8 cylinder motors. It gives its hottest spark for starting and at low speeds and at the highest attainable motor speeds delivers a better spark than the magneto.

We will gladly answer inquiries in detail.

CONNECTICUT TELEPHONE & ELECTRIC COMPANY, Inc., Meriden, Conn.

When Writing to Advertisers, Please Mention Motor Age.



He Stopped

When the big red indicator of his Motometer registered "danger," he shut off the motor quick. It's good for him he did. The radiator-petcock had jarred open and the water all run out. But for the Motometer, his costly cylinders would have been irreparably damaged.

The Motometer saves repair bills. It makes motor-damage an impossibility. Costs only \$10 or \$5, according to the model. Ford Special, \$5.50. Fully guaranteed. Thirty days' trial allowed by dealers. Where not represented, we sell direct on same terms. Write us at once.

The Motometer Company, Inc.
1790 Broadway New York City

**BOYCE
MOTOMETER**
Makes the Motor damage proof



Would you like to control a new motor utility?

Any person or Company willing to invest a small amount of money has a chance to buy one of the biggest little things in the motor car industry today.

It is a product of the laboratory department of a Company of recognized standing who has tested the article on the market for a year to prove its practical utility.

If interested please write for particulars.

McCormick Laboratories
McCormick Manufacturing Company
Dayton, Ohio, U. S. A.

"Exactly What You Wanted To Know, Told So You Can Understand It"

THE MOST "USABLE" AUTOMOBILE BOOK EVER PUBLISHED
FOR OWNERS, REPAIRMEN, DRIVERS, STUDENTS AND SALESMEN

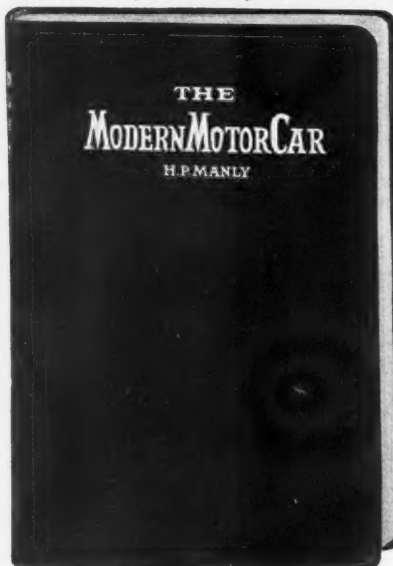
FIVE BOOKS IN ONE COVER
—512 Pages—217 Illustrations,
Drawings, Diagrams and Charts

I

PARTS OF THE CAR—Their Construction, Use, Care and Repair. Contains simple rules for performing every mechanical operation the car can ever need. Not only covers the newest developments, such as eight cylinder engines, vacuum fuel feed, etc., but contemplated improvements from the makers of cars and parts.

II

MATERIALS AND SUPPLIES—How to Use, Buy or Make Everything Needed in Running the Car.



III

ELECTRICITY—Its Underlying Principles Interestingly Explained.

IV

ELECTRIC LIGHTING, ENGINE STARTING AND CONTROL—First Complete Explanation. Covers such things as electric gear shift, electric brake, Edison storage battery, new magnetos and new time saving methods of wiring.

V

IGNITION PARTS—Design, Construction, Care and Repair of Every Standard Form of Ignition Appliance as Well as Newest Adaptations.

INDEX

24 PAGES—Listing 1165 Headings Under Every Possible Classification.

"The Modern Motor Car"

The first complete book on upkeep and repair ever written. A money saver for every man interested in motor cars. Brand new from cover to cover. Contains no history, out-of-date or obsolete matter. Written in non-technical language.

Bound in Black Morocco with Flexible covers, Gold Lettering and Polished Edges the MODERN MOTOR CAR sells for Only **\$2.50**

THE CLASS JOURNAL COMPANY

900 MICHIGAN AVENUE, CHICAGO, ILLINOIS

Published in
the Interest of
Better Business
for
DEALERS

Inter-State BULLETIN

Announcement

EXTRA

Read it!

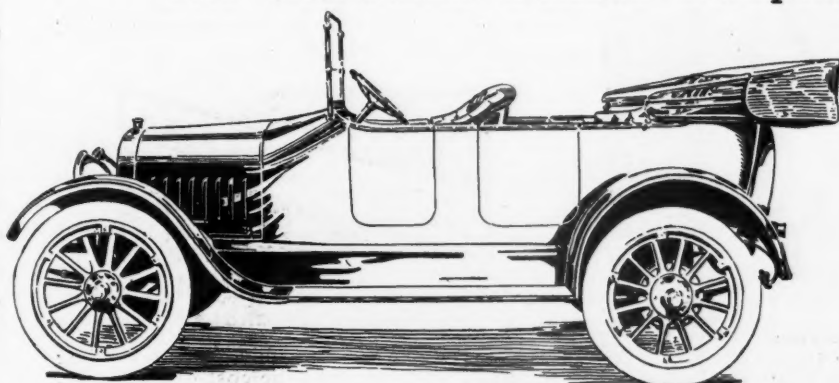
Volume 1.

Muncie, Indiana, November 26, 1914.

Bulletin 5

BIG COMPANY ANNOUNCES NEW POPULAR PRICED MODEL

Sturdy Inter-State Sells For
One Thousand Dollars Complete



The New Inter-State "30"—fully equipped—\$1000

Manufacturing Facilities Makes Price Possible

The New Inter-State is distinctly a car built up to a price and not a high priced car, cut here and there in quality to meet a price.

Seven years ago this car was conceived by one of the most competent automobile authorities in the country, a man who has for years been associated with the retail and wholesale trade, and knows specifically what the public wants. Today this idea is expressed in the new Inter-State at \$1000 fully equipped.

Every feature of design and construction has been chosen after the most careful deliberation on the part of the strong company behind this car. One of the biggest departures from the usual practice in popular priced cars is the excessive foot room both front and rear.

Investigation will prove that by performance and comparison the Inter-State "30" represents a dollar for dollar investment.

The price of One Thousand Dollars for this car is possible because of the company behind it. Every officer in the company, and every man in the factory, is thoroughly familiar with, and a strong man in, his position.

The buying power of this organization, and their "Cash Down" policy, rigidly adhered to, for materials, makes it possible for them to sell the Inter-State for \$1000.

Few people are familiar with the size, magnitude and factory equipment of the Inter-State Motor Company. With the right kind of an organization, low overhead cost, and big modern factory, the company is able to build on a quantity basis, this car for \$1000.

Comparison the True Test of Selling Value

Motor—Four cylinder, 30 h. p.; cylinders cast en bloc; $3\frac{1}{2}$ " bore, 5" stroke. Overhead valves enclosed, removable cylinder heads.

Carburetor—Automatic float feed, easily accessible.

Ignition—Jump spark.

Clutch—Aluminum Cone, leather faced.

Transmission—Selective type. Three speeds forward, mounted on the rear axle.

Steering and Control—Left hand steering, center control.

Axles—Front, I-beam section; rear, floating type, bevel drive; Hyatt and annular bearings.

Wheelbase—110".

Tires—33x4, front and rear, oversize.

Springs—Highest quality English manganese; $\frac{1}{4}$ " elliptic rear, underslung; front, half elliptic.

Body—Full five passengers, stream line type in every detail, deep cowl, extra wide doors, genuine hand buffed leather, Turkish cushions, deep backs, abundant leg room both front and rear. Finished in Inter-State blue. Instrument board within easy reach of driver. Gasoline tank under cowl. Filler neck under hood.

Lighting and Starting—Two unit Remy Electric Starting and Lighting system. Fly wheel—transmission type; no sprockets, chains or over-running clutches employed. Head lamps with dimming feature. Instrument board lamp, electric horn and tail lamp.

Equipment—Improved one-man top, double ventilating windshield, speedometer, gasoline gauge, robe rail, foot rest, tire carrier and spare rim, and complete set of tools.

WONDERFUL OPPORTUNITY FOR HUSTLING DEALERS

Much Territory
Already Allotted

Dealers who have been associated with this company in the past, and who know, or have had an inkling of what our policy would be for 1915, have asked for territory even before the company was in a position to make deliveries.

The Inter-State is in the field to stay, and investigation of the personnel of this organization, of the factory and of the financial stability of the company will prove that this claim is a just fact and not an idle assertion.

Dealers who feel the need of a high-grade, popular-priced car, built along the latest and most up-to-date lines, will get in touch with the Inter-State Motor Company without delay.

There are selling points in this car that it will pay you not to overlook.

If there is no Inter-State dealer in your town, write us today for our advance literature and our dealers' territorial plan. Delay may mean someone else will be ahead of you. It will mean prosperous season if you write today and become a member of the Inter-State family of money-making dealers.

Inter-State Motor Company
802 W. Williard St. Muncie, Ind.

GARFORD

3-Inch Type SPEEDOMETER



FOR FORD CARS

Specially designed to meet Ford requirements—not a big car speedometer cut down to Ford size.

Operates on the cup and ball principle—conceded for its accuracy, dependability and permanence to be the construction which most logically meets Ford conditions. Jar, vibration and road shock will not affect it.

Absolutely simple. No hair-springs, jewels or sensitive mechanism to impair accuracy or make for trouble.

The easiest-read speedometer on the market.

Has a steady hand which moves over the scale without a quiver and shows instant changes in the speed of the car. This is very important with the Ford car, owing to vibration.

Boasts a 100,000 mile season and 100 mile trip odometer. Manufactured and fully guaranteed by one of the best known accessory concerns in the industry.

Price, \$12.50

Complete With All Connections

To be had at your dealer's, or sent direct on receipt of price.

Dealers and Jobbers Wanted Everywhere

The Garford Mfg. Co.

2503 Olive St. ELYRIA, OHIO, U. S. A.
BRANCH—The Garford Mfg. Co., Kansas City, Mo.

DISTRIBUTORS

The Dean Electric Co., Seattle, Wash.
The Dean Electric Co., Los Angeles, Cal.
Sumter Telephone Supply Co., Sumter, S. C.

Strongest at
center where
the greatest
strain comes

The Tuthill Guarantee Says "No Center Breakage"

In our Tuthill Titanic we give you a spring that won't break where 75% of all other springs do break—the center. We don't just guarantee it against "defects in workmanship and materials"—we say to you—"If our Tuthill Titanic breaks at the center, any time, any place, we will replace it free, and pay the express charges on the new spring." This guarantee is made by no other manufacturer. It is in addition to our regular guarantee that goes with each Tuthill Spring—Titanic or otherwise.

We make this guarantee because of the elimination of the weakening center bolt.

Tuthill Springs are made of the highest quality steel, and during process of manufacture are given a series of rigid tests that disclose the slightest imperfection.

**Guaranteed Absolutely Against
Center Breakage**

A Tuthill Spring not only increases riding comfort, but it reduces the cost of upkeep—it prevents the jars and jolts that play havoc with the delicate mechanism of your motor and wear out tires. Vibration is reduced to such an extent that it is hardly noticeable.

Tuthill Special Repair Service

While the Tuthill Titanic is unbreakable, we maintain a large Service Department for the prompt repairing of other springs which do break. We are prepared to express, on a moment's notice, a spring for practically any model of any car.

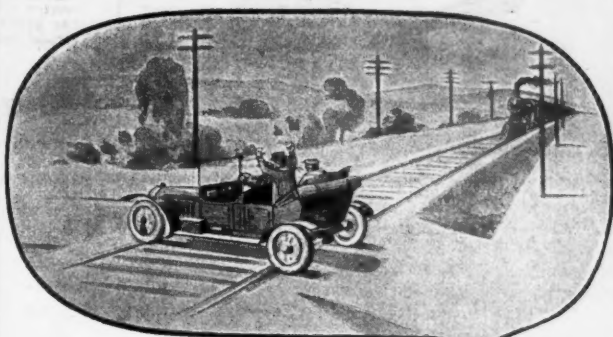
Motorists need no longer lay up their cars because of a broken spring as Tuthill Service enables the dealer to guarantee every one of his customers prompt repair service. A Tuthill Titanic Spring costs no more than other springs of the same quality—the profit to the dealer is larger—and the car owner is given a better spring.

Write for price list.

TUTHILL SPRING CO.
762 Polk Street

Chicago
1781

Tuthill Titans
are guaranteed
not to break
at center



"I just got to the middle of the track, and there my engine stopped dead.

Had it not been for the Gould Storage Battery and starter the locomotive certainly would have struck us."



Confidence daily inspired by the dependability of a Gould Starting and Lighting Battery invariably helps a driver to keep a cool head when his engine stalls in a critical place.

With a Gould Battery you get quick emergency action and a wealth of cranking power to tide over periods during which engine wrongs are being righted. And you are sure of constant and lasting high capacity because of the resistance of our hard-paste-composition plate to deterioration from vibration and hard service.



Another exclusive Gould Battery feature is the large expansion chamber to facilitate the inspection and filling of each cell. A top seal keeps the acid inside; the outside stays clean.

We make these batteries in all S. A. E. standard sizes. Ask for prices.

Gould Storage Battery Co.

General Offices: 30 E. 42d St.
New York City

Boston—14-16 Cambria St.
Philadelphia—613 Betz Bldg.
Cleveland—1761-5 E. 18th St.
Detroit—88 E. Congress St.

Works:

Depew, New York

Chicago—225 E. 22nd St.
San Francisco—1448 Van Ness Ave.
Los Angeles—110 E. Pico St.

Agents in

Washington, Rochester, Buffalo, Pittsburgh, Milwaukee, Minneapolis, St. Louis, Kansas City, Omaha, Denver, Topeka, Seattle

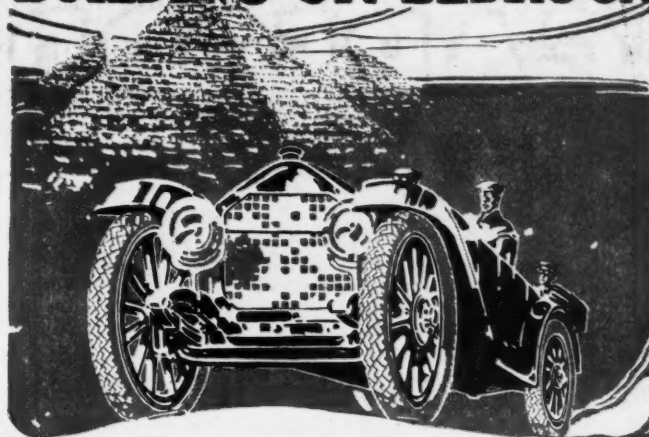
CANADIAN REPRESENTATIVE:

R. E. T. Pringle, Toronto, Montreal, Winnipeg, Vancouver

Full stock of parts, plates and repairs carried by all offices and agents.

133

BUILDING ON BEDROCK



IT would be impossible to make and sell Marathon Tires at the price we do if almost every first sale did not make a permanent customer for



We know that noisy clamor and resounding claims still sell hundreds of thousands of tires, but—

Marathon policy is based confidently upon the faith that there are enough car owners who appreciate real quality to make such a policy profitable in the long run.

This policy demands, of course, that Marathon Tires shall always be as good as they are today.

Cheaper tires are made, we know—better tires can't be.

The dealer who identifies himself with Marathon Tires and the Marathon policy builds a lasting trade and cannot fail to profit by it.

We are looking for more dealers now. Write for more facts about the Marathon policy and Marathon terms.

The Marathon Tire & Rubber Co.
Cuyahoga Falls, Ohio

MAKE \$250⁰⁰ A MONTH REPAIRING AUTOMOBILE TIRES

Sounds like a lot of money—IT IS—A WHOLE LOT of MONEY to be earning CLEAR every month—yet it's what hundreds of men we have established in the Automobile Tire Repair Business are making. You let down the DRAW BRIDGE for SUCCESS to enter into your career by getting into business for yourself. The business for you is the one where investment is small—the returns quick and for cash—where the margin of profit is large—the demand for your PRODUCT or SERVICE constant and ever on the increase.

A Haywood Tire Repair Equipment

tainty of success in this business is as sure as anything in this world can be—Each year adds thousands of new Automobile Owners—they need YOU to keep their tires in service.

Here Is Your Opportunity!

Be first to enter this new, big paying business in your town. Open your pockets. Let the dollars pour in. Act quick. Every auto sold means more tires to mend. Automobile business is growing fast—enormous field for tire repairing. Punctures and blowouts are common. Tires need retreading and vulcanizing. Something going wrong all the time. Thousands forced to buy new tires because they can't get old ones fixed. Think of the old bicycle days—repair shops on every corner—all making money—busy day and night. Autos make same proposition over again—only ten times bigger and better. Users of Haywood Tire Repair Plants are making big money. Johnston, Tex., writes: "I have made as high as \$18 in a day." Another man who bought a plant September, 1911, writes he has cleared over \$3000.00. That's going some! Operate a plant as a side line in connection with auto business—garage or as an independent business. Find neighborhood where there's a bunch of autos—get all the steady business besides transient work. Experience unnecessary. You learn quick. Simply follow directions—practice a few days on a couple of old tires and you'll be ready to coin money. Business comes fast and easy.

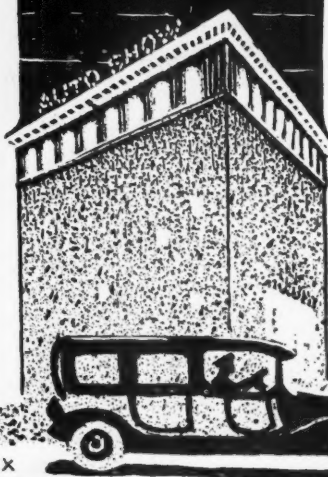
HAYWOOD TIRE & EQUIPMENT COMPANY

Repair Tires At Home

Young men! and boys repair father's tires—get money he pays garage man. Get the neighbor's work. Make money to attend college or to start a garage and repair business. Auto owners—repair your own tires—save money—pay for your outfit in short time. We have outfits for home use. Anyhow, investigate. Send today for catalogue. See the wonderful possibilities in this marvelous field. Learn of the enormous money-making opportunities in this fascinating new business.

720 N. Capitol Avenue
INDIANAPOLIS, INDIANA *The New Money-Making Business—Start Now*

This Man is Making Money



WHERE YOU'LL MEET THE AUTOMOBILE MEN YOU WANT TO KNOW

Before starting for the New York Automobile Show be sure that your reservations are made at the famous automobile man's rendezvous—The Hotel Martinique.

Year after year when the great migration occurs the same well-known faces appear in the Martinique Hotel for a week or two of profitable association.

If you want to be in the heart of things and among those most influential during the automobile show, be sure and make arrangements in advance for comfortable and reasonably economical quarters at the Martinique.

\$2.50 PER DAY

A pleasant room with private bath, facing large open court.
(Not one room, but one hundred of them.)

\$3.00 PER DAY.

An excellent room with private bath, facing street, southern exposure.
(Not one room, but eighty-seven of them.)

Also attractive Room without Bath **\$1.50** per day.

The Restaurant prices are most moderate.

THE HOTEL MARTINIQUE

"The House of Taylor"

On Broadway, 32d to 33d Street, New York

CHARLES LEIGH TAYLOR, President

WALTER CHANDLER, Jr., General Manager

WALTER S. GILSON, Vice President

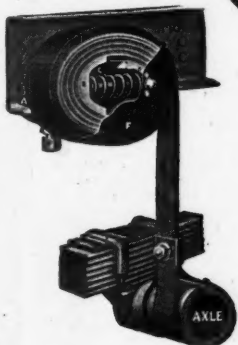
GABRIEL SNUBBERS

Make Your Car Ride
Easy and Last Longer

Longer and Longer Flexible Springs

are being demanded by car buyers and furnished by car builders. They add to the riding ease on small bumps; but allow more side-sway and more up-throw on big bumps when not loaded to the limit.

Snubbers are the *one* device that prevents the excessive action of long, flexible springs, just as they prevent the abrupt, snappy rebound of shorter and stiffer springs.



As the car springs compress and frame nears the axle, the expansion of coil spring "C" takes up the slack in the belting "D." Then as the springs begin to rebound, the coils of belting tighten. In so doing, they create a friction on the layers of brass band "E." This friction increases gradually as coil spring "C" is compressed, forming a gradual and firm resistance to upward motion of car body, in direct proportion to the severity of the shock.

Ask the Engineers of Your Car About Snubbers—They Have Tried Them and Know.

Standard Factory Equipment on the easiest-riding cars, including Chalmers, White, Peerless, Stearns-Knight, Oldsmobile and Lozier; partial or special equipment on more than twenty other leaders. Get in line!

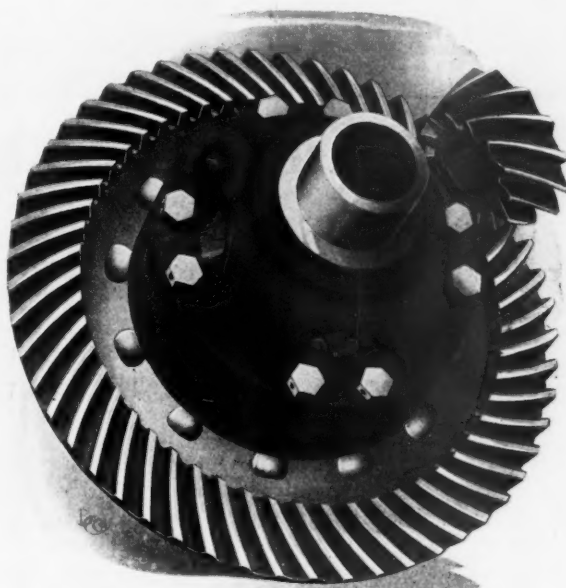
Gabriel Horn Mfg. Co., 1415 E. 40th St., Cleveland, O.

GABRIEL SNUBBERS

PRICES:

\$15, \$20, \$25 per set of
Four; two front and
two Rear.

Half that per
pair.



MODEL D19 DIFFERENTIAL
SPIRAL GEARS

WARNER DEPENDABILITY

THE REPUTATION OF
WARNER PRODUCTS FOR ABSO-
LUTE DEPENDABILITY UNDER
MOST SEVERE SERVICE, IS THE
RESULT OF CONSTANTLY MAIN-
TAINING THE HIGH STANDARD
OF WARNER QUALITY.

"HIGHEST QUALITY"
TRANSMISSIONS

"HIGHEST QUALITY"
DIFFERENTIALS

"HIGHEST QUALITY"
STEERING GEARS

"THE ORIGINAL"

WARNER GEAR COMPANY,

MUNCIE,
INDIANA

DETROIT OFFICE, 910 FORD BUILDING

"Hook On This Autowline I'll Pull You Out"



BASLINE AUTOWLINE is the motorist's sure reliance in getting out of road difficulties. A car in a ditch, or a "dead" engine at the foot of a hill, doesn't trouble this little, pliant, 25-foot puller!

Basline Autowline

"The Little Steel Rope With The Big Pull"

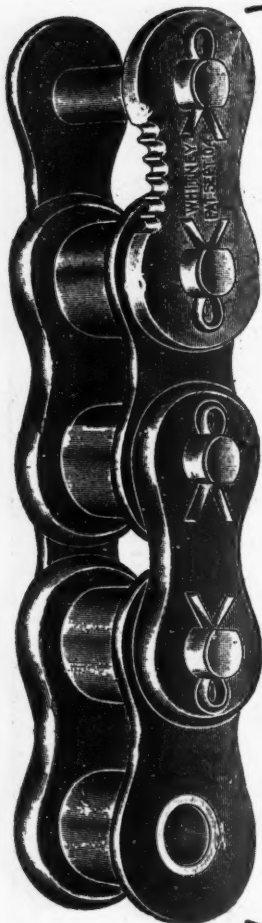
has the flexibility, toughness and staying qualities of the world's most famous steel wire rope—"YELLOW STRAND POWERSTEEL." It will take a 4000-lb. car up a 20% rise without a quiver. It's always ready to take a tow or give one. Neat, compact, easy to carry and easy to use—motorists are finding Basline Autowline the one accessory they can't afford to forget. Sold by all dealers everywhere. East of the Rocky Mountains, \$3.95. Ask about it today.

FREE An illustrated circular giving all needful Autowline information

Broderick & Bascom Rope Co.

813 N. Second St. St. Louis, Mo.
New York Office, 76 E. Warren St.

Manufacturers of famous Yellow Strand Power-steel Wire Rope that helped build the new Municipal Building, New York.



"Whitney" Chains Are Used by the Leaders

They have been the recognized leaders for years and are the most practical chains built for commercial vehicles.

We have completed a large addition to our factory, making it the most modern and complete factory of its kind in the country, and are now in position to fill orders promptly.

Insist on "Whitney" Chains when making replacements.

**"Whitney" Chains
Are Built for Strains**

The Whitney Mfg. Co.
Hartford, Conn.

No Danger

Not even with the contents of a gasoline can poured all around the Auto Hot Garage Heater would there be the slightest possibility of danger of fire or explosion. Think what this means to you—an appliance for keeping your garage warm and dry year around with perfect safety to yourself and your property.

THE AUTO-HOT Home Garage Heater

puts an end to winter motor car annoyance and expense. Does away with frozen radiators, cracked water jackets and starting troubles. Permits you to make all necessary repairs in a room just as warm and comfortable as your living room. Burns either natural or artificial gas and costs but a few cents each day to operate.

For sale by gas companies in artificial gas cities and by plumbers, stove dealers and automobile supply dealers in natural gas cities.

Our booklet, "Winterizing the Motor Car," tells all about it. Write for it today.

THE KANNEBERG ROOFING & CEILING CO.
No. 114 Ninth St., S. E. Canton, O.

HIGH and
LOW TENSION
MAGNETOS



MASTER VIBRATORS
ROAD SMOOTHERS
AUTO LOCKS

Ten Reasons Why the MASTER VIBRATOR



is the Standard of Excellence all over the world.

ITS Use Means

Perfect ignition—more power—a hotter spark—easier starting—one adjustment instead of four—a smoother running engine—less gasoline used—cleaner spark plugs—less carbon deposits—no worry service.

Beware of Imitations

Genuine K-W Master Vibrators all carry the K-W trademark and a serial guarantee number. They are sold by dealers who know the difference, everywhere.

\$15 with Regular Kick switch
\$16 with Yale Auto Lock switch

IF YOUR DEALER CANNOT SUPPLY YOU, SENT DIRECT POSTPAID ON RECEIPT OF PRICE. WRITE FOR BOOKLET.

HEADLIGHTING
OUTFITS

THE K-W IGNITION CO.
2835 CENTER AVE.
CLEVELAND, OHIO, U.S.A.

SPARK COILS
SPARK PLUGS



Magneto ignition superseded old-time battery ignition by reason of its greater reliability, for, in addition to ignition troubles arising in connection with electro-magnetic vibrators, mechanical timers, and timer-distributors, the batteries proved to be non-durable and subject to rapid deterioration on standing.

Insist upon SPLITDORF MAGNETO
IGNITION—IT'S NECESSARY

SPLITDORF ELECTRICAL COMPANY
NEWARK, N. J.

HERZ PLUG

The reasons for HERZ PLUG'S superiority to ordinary makes are definite and obvious. The insulation is **DOUBLE STONE**. The electrodes are **PLATINUM-ALLOY**. There are **FOUR SPARKING POINTS**. HERZ PLUG is **SELF-CLEANING**. It is **GUARANTEED A FULL YEAR**.
Price, \$1.50. Order from your dealer or
HERZ & CO., 245 W. 55th St. (near Broadway), New York

*For Comfortable Winter Driving
There Is Nothing Quite
So Fine As*

Ieco **STEER WARMS**

STEER WARMS consist of two *electrically heated*, leather covered grips that lace on the steering wheel. They keep your fingers and hands from becoming chilled on the rawest day—and that means you are warm all over. They take only a minute to attach. Lace on; wire up. That's all. No marring the wheel. No holes to bore. A switch conveniently located regulates the heat. The current is taken from the battery, electric lighting system or generator. Very little current required. Guaranteed to give satisfaction and not to burn out within five years. Money back if they do.

PRICE: \$7.50 per pair, complete, ready to attach to any car. Special Ford STEER WARMS \$5.00.

DEALERS: Car owners everywhere want STEER WARMS.

Get your share of this business while the season lasts. We stand back of you, with our positive guarantee. Write today for discounts.



**Interstate
Electric Co.**

"Do It Electrically"

New Orleans, Louisiana

Patented 1912 and 1913.
Other Patents Pending.

MERCER

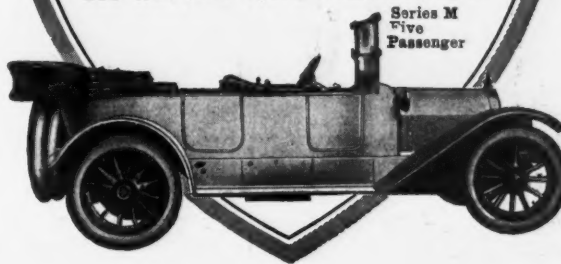
The Pride of America

There is always a feeling of safety and reliability when traveling at speed in a Mercer, because the severe tests to which these cars have been subjected, in all forms of trials, have proven that for durability and efficiency there is no car capable of giving greater satisfaction.

Literature mailed on request

Mercer Automobile Co.
800 Whitehead Road, TRENTON, N. J.

Series M
Five
Passenger





PREVENTS BLOWOUTS!

It regulates tire pressure, prolongs the life of new tires and insures the old ones. Enables you to carry standard pressure of air in your tires during the hottest day without danger of blowouts.

MYERS TIRE SAFETY VALVE

It releases the extra pressure caused by expansion from heat or friction. County and state agents wanted everywhere. We can make immediate deliveries. In order to get the right kind of dealers we demand a small investment.

W. M. MYERS

614 Postal Telegraph Bldg., Chicago, Ill.

WINTON SIX

Write Your Own Guarantee

There is no doubt in our minds that the most enjoyable car, the most thoroughly perfected car, either in Europe or America, is the Winton Six. It is unique in both its goodness and its beauty; and when you buy one you may have your own color scheme and write your own guarantee. We are now delivering the 1915 model.

THE WINTON MOTOR CAR COMPANY

424 Berea Road, Cleveland, Ohio

World's First Maker of Sixes Exclusively

You should (not) worry
about your battery being under-charged
You will not worry
if your car has the

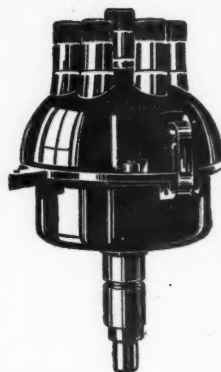
LEECE - NEVILLE

STARTING and LIGHTING SYSTEM

It's making good every
day on HAYNES CARS

WRITE US FOR FULL INFORMATION

The Leece-Neville Company
1059 Power Avenue CLEVELAND, O.
(86)



The Atwater Kent Ignition System

Adopted by 60 Manufacturers
in the Past Year

4934 STENTON AVENUE
PHILADELPHIA, PA.

Dayton Airless Tires

For War—Recommended by American and Foreign Experts for motor car service.

For Peace—Used all over the United States on cars of all sizes. Comfort and absolute freedom from tire annoyances.

For Fords—We are obliged to double our production on these sizes every three months. Enough said.

For All Cars—A tire that is absolutely blow-out proof and puncture-proof.

For You—Write today for full details and name of nearest dealer.

THE DAYTON RUBBER MFG. COMPANY
DAYTON, OHIO



IT'S GETTING COLD

but your engine will start as quickly as in Summer and the cylinders will fire as regularly if equipped with



1915 PRIMING PLUGS

Masters the motor at any temperature

All Sizes \$1.25 Porcelain or Mica

FORD DEALERS: Write for new price

EMIL GROSSMAN MFG. CO. Inc.

Bush Terminal Model Factory No. 20, Brooklyn, N. Y. C.
Detroit—708 Ford Building.

Electric Auto-Lite Starting—Lighting—Ignition

Electric Auto-Lite equipment for automobiles is as famous for the service that backs it as for the reliability and economy of its operation.

ELECTRIC AUTO-LITE COMPANY

Home Office and Factory: Toledo, Ohio

New York Detroit Kansas City San Francisco

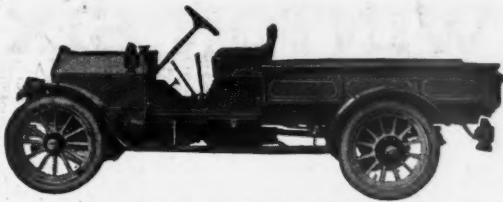
Polarine

FRICION REDUCING MOTOR OIL

Maintains the correct lubricating
body at any motor speed or heat

STANDARD OIL COMPANY

(AN INDIANA CORPORATION)



Model A-3, 1-500-lb. Truck, Complete with Express or Stake Body, \$1,200—Chassis only, \$1,125.

Not a "Fair Weather" Truck

Some trucks are all right when road, grade and load conditions are all right. MENOMINEE Trucks show their true form under the most unfavorable conditions.

"The MENOMINEE" TRUCKS FOR ECONOMY

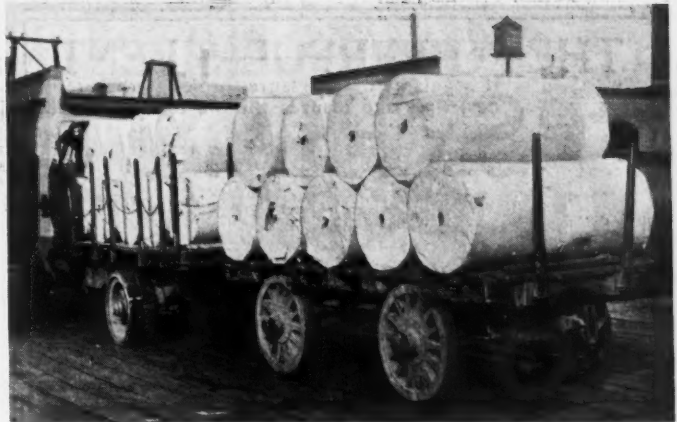
Overloads, mud, ruts, sand and steep grades—MENOMINEE Trucks are built sturdy as a locomotive for just such emergencies!

For that reason MENOMINEE Trucks stay sold—give perfect satisfaction throughout long periods of service. MENOMINEE users come back with repeat orders for more MENOMINEES.

The 1915 line of MENOMINEE Trucks comprises a 1500-lb. truck at \$1125; a 1-ton truck at \$1400, and a 1½-ton truck at \$1800.

Write for catalog and dealer's proposition.

D. F. POYER COMPANY
MENOMINEE, MICHIGAN



Making the Trailer Pay for Itself and the Truck too

Here's a 5-ton truck that hauls 10 tons on every trip. It has hauled 14 tons. It's the Troy Trailer that does the trick.

The first trailer was bought a year ago. It reduced hauling costs so much that a second trailer was purchased in the early summer.

Troy Trailers are used in all parts of the country, in all kinds of weather and in all classes of business.

Send for Troy Trailer Booklet 4MA

The Troy Wagon Works Company
Troy, Miami County, Ohio

Troy Trailers

Lexington

CRITERION OF ITS CLASS

Thoroughbred Six—\$1875 Famous Four—\$1375
Six Supreme—\$2575

All equipped with the Moore Multiple Exhaust

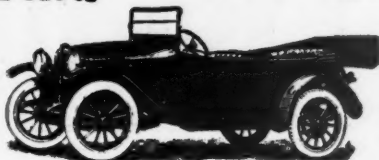
Write for Details and Co-operative
Dealer Proposition

The Lexington-Howard Co. Eighteenth Street West
Connersville, Ind., U. S. A.

The Detroit—\$985

With Westinghouse
Starting and
Lighting System

FIRST
Pure
European
Streamline
in This
Country



FIRST
Long-
Stroke
Ball-
Bearing
Motor

Full Floating Rear Axle, Platform Rear Spring Suspension, All Recording Instruments in One Unit, Red Electric Flash Oil Gauge, Carburetor Above Frame, 112 Inch Wheel Base, Left Hand Drive, Center One-Lever Control, Multiple Disc Clutch in Oil, Less than 2300 Pounds, 32 H. P.

Briggs-Detroit Co., 455 Holbrook Ave., Detroit, Mich.

Write for Catalog and Proposition

20
30
40
50
Twitchell
Air Gauge
The New Positive Lock Stop



feature renders absolutely impossible the registration of any but the exact pressure in your tires.

Don't Guess

Tires inflated to forty pounds look and feel exactly like tires containing eighty. The only way to tell the exact air pressure in your tires is by means of a TWITCHELL gauge.

Price One Dollar

For Sale by Jobbers, Dealers and Garages, or

THE TWITCHELL GAUGE CO.
1201 MICHIGAN AVE., CHICAGO

THE POWERFUL, SILENT SPHINX

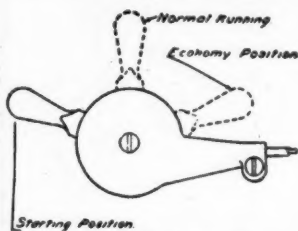
\$695

A REAL AUTOMOBILE

The lightest, strongest, most serviceable and economical machine of its kind ever built.
112 inch wheel base. Electrically started and lighted.
Sphinx Motor Car Company, York, Pa.

MASTER Carbureters

COPYRIGHTED



Address Dept. J for Full
Descriptive Booklet

With the MASTER CONTROL it is never necessary to run with a poor mixture.

Since atmospheric conditions cannot be controlled, a proper mixture can be maintained at the will of the driver to suit the varying atmospheric conditions.

MASTER CARBURETOR CORPORATION
Woodward and Hancock Detroit, Michigan
Pacific Coast States: Master Carburetor Co., Inc., Los Angeles

THE RUTEMBER MOTOR

possesses the virtue of economy in first cost and in subsequent up-keep, revealing the merit of sterling quality in every detail of construction and renders as consistent and efficient service as motors costing twice as much to buy and maintain.

THE RUTEMBER MOTOR CO., MARION, INDIANA

HOUK Detachable WIRE WHEELS

"The wheel that makes any car modern"

GEORGE W. HOUK COMPANY
1702 Elmwood Avenue, Buffalo, N. Y.

Guaranteed for 10,000 Miles Bricton Pneumatic Tires

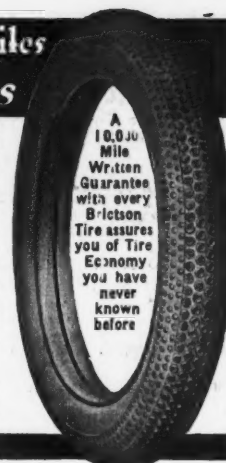
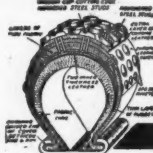
We now sell Bricton Pneumatic Tires on a specific guarantee of 10,000 miles service. Bricton Pneumatic Tires are Puncture-proof, Blowout-proof, Skid-proof, Rut-proof, Rim cut-proof, Oil-proof and Gasoline-proof. A tire with wonderful resiliency and easy riding qualities.

FREE TRIAL OFFER—To remove any possible doubt concerning the merits of Bricton Tires and to back up our statements fully, we have a FREE TRIAL offer at our own risk. The only tire made that offers a FREE TRIAL—you can't go wrong. You risk nothing. We take all the risk. Be sure and ask for our FREE TRIAL plan when you write for particulars.

Have Your present Tires Rebuilt the **BRICTON WAY**—

If you are not in need of new tires and the fabric in your tires is still good, we can rebuild them the Bricton Way, give you thousands of miles additional service and make them Puncture-proof, Blowout-proof, Skid-proof, Rut-proof, Rim cut-proof, Oil-proof and Gasoline-proof.

Write today for full particulars including details of FREE TRIAL PLAN
THE BRICTON MFG. CO.
12-114 Bricton Bldg., Brookings, S. Dak.



**SINGLE UNIT
STARTING &
LIGHTING
SYSTEM**

**— DYNETO ELECTRIC CO. —
SYRACUSE — NEW YORK**

**SIMPLE, COMPACT
WEIGHT ONLY 45 LBS.**

Sparton Warning Signals

for the low—the medium
and the high priced cars,
motor driven & hand operated.

PRICE from \$4.25 to \$15.00

Write for DEALERS' Proposition

The Sparks-Withington Co., Jackson, Mich.

SALISBURY

**AXLES WHEELS
PROPELLERS**

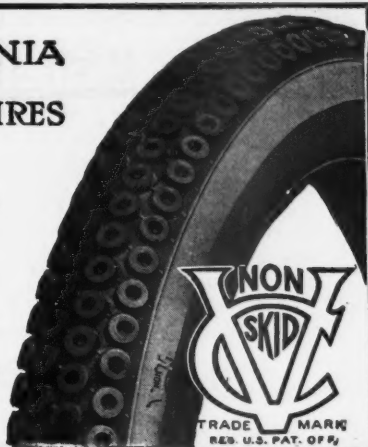
**Salisbury Wheel
& Mfg. Co.**
JAMESTOWN, N. Y.

PENNSYLVANIA Oilproof VACUUM CUP TIRES

Making their
mark everywhere

Guaranteed for
4500 miles

**Pennsylvania
Rubber Company**
Jeannette, Pa.



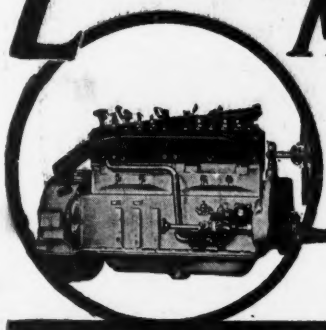
Firestone

Removable Rim Equipment For Truck Tire Service

Owes its unquestioned leadership to two things—ease of operation and scientific construction. Write for the catalog of "Common Sense Principles."

FIRESTONE TIRE AND RUBBER COMPANY
Akron, Ohio Branches and Dealers Everywhere

Continental Motors



FOURS
Model U, 2 3/4 x 4 Model C, 4 1/2 x 5 1/2
Model N, 3 1/2 x 5 Model E, 4 1/2 x 5 1/2
Model N, 3 3/4 x 5 Model T, 5 x 5 1/2
Model C, 3 3/4 x 5 1/2 Model T, 5 1/4 x 5 1/2

SIXES
Model 6-N, 3 1/2 x 5
Model 6-P, 3 3/4 x 5 1/2 Model 6-C, 4 1/2 x 5 1/2

Continental Motor Mfg. Co.
Detroit, Michigan
Factory Representative, K. F. Peterson,
122 S. Michigan Ave., Chicago

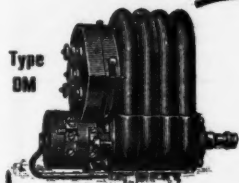
For the Cowl or Dashboard— Weston MODEL 301 Ammeters



Specially built for continuous reliability in automobile service. Weston improvements and minute attention to the perfecting of detail have raised them far above any other small instruments in accuracy, durability, appearance. Despite its high standard of service, Weston Model 301 is surprisingly inexpensive.

Weston Electrical Instrument Co., Newark, N. J.

New York Boston San Francisco Atlanta Berlin and
Chicago St. Louis Detroit Richmond London
Philadelphia Denver Cleveland Toronto



HEINZE

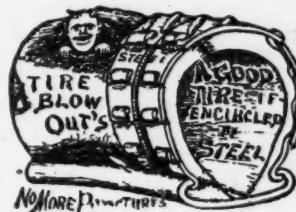


The performance of **HEINZE IGNITION APPARATUS** for the past ten years justifies our claim that our product is superior in both points of construction and efficiency.

HEINZE ELECTRIC COMPANY

SALES OFFICES—DETROIT, MICHIGAN
FACTORY—LOWELL, MASS.

Service Stations—New York, Detroit, Chicago, Kansas City



Steel Protectors

Each section 2" wide 1/8" thick. They hook to rim. As flexible as ever. Anti-skid, can't blow out or rim cut.

**HOW CAN THE RUBBER WEAR OFF
IF IT IS COVERED WITH STEEL?**

Try 2 or 3 sections over any old blowout

Special prices to the first in new territory

Kimball Tire Case Co., 178 Hwy., Council Bluffs, Ia.



Tire covered complete



THINK THOUSANDS OF MILES
AHEAD, AND YOU WILL BUY
REPUBLIC MILEAGE
PLAIN AND STAGGARD TREAD
TIRES

THE REPUBLIC RUBBER CO.
YOUNGSTOWN, OHIO.

BRANCHES AND AGENCIES IN THE PRINCIPAL CITIES

Be Sure You Get the
GENUINE

TRADE MARK **NON-FLUID OIL** REGISTERED IN
UNITED STATES PATENT OFFICE

The great success of **NON-FLUID OIL** for motor car lubrication has given rise to a widespread imitation of the name in various arrangements which suggest **NON-FLUID OIL**. They can imitate the name, but not the **QUALITY**. Hence, your only protection is to look for and insist upon the **ORANGE-COLORED** can bearing sprocket-wheel trade-mark shown above. Lubricates better—lasts longer—most economical.

"K. No. 00 Special" grade for sliding gear transmission.
"K. No. 000" for differential, compression cups and all bearings.

Sold by leading dealers everywhere

New York & New Jersey Lubricant Co.

165 Broadway, New York

1430 Michigan Ave., Chicago



Searchlight Gas

the most economical and dependable lighting system on the market.

Full details mailed to you on request.

THE SEARCHLIGHT CO.
GENERAL OFFICE, 1016 KARPEN BUILDING
CHICAGO, ILL.

PAIGE

Model "36" \$1195.00

A car whose design and construction is so far ahead of others at its price that it is in a class all its own.
Gray and Davis Electric starting and lighting equipment, silent chain cam shaft drive, four inch by five inch motor, cork insert multiple disc clutch, 116 inch wheel base, left side drive, center control, and equipment complete to the last detail.

Model "25" \$925.00

Including Electric Starting and Lighting System

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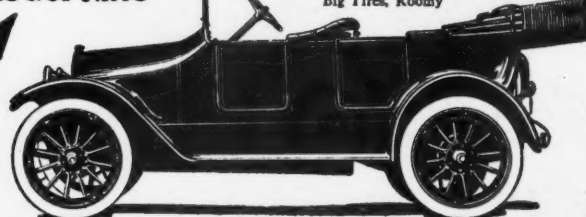
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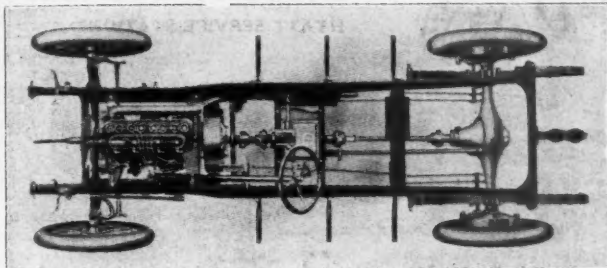
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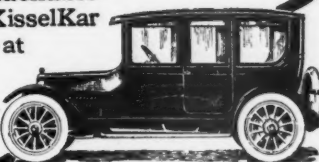
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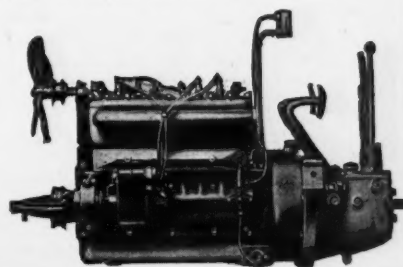
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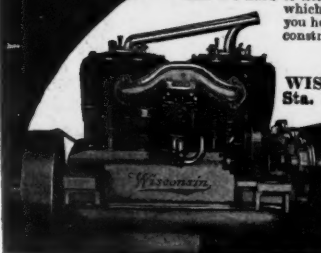
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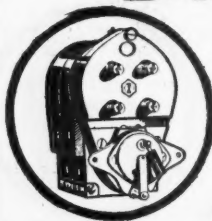
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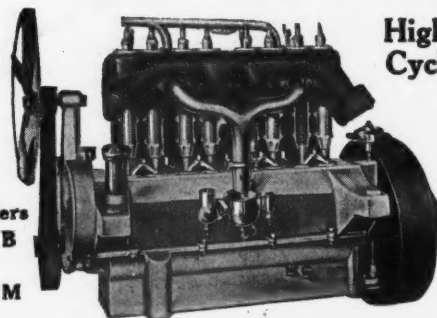
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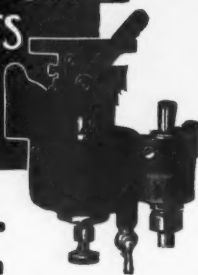
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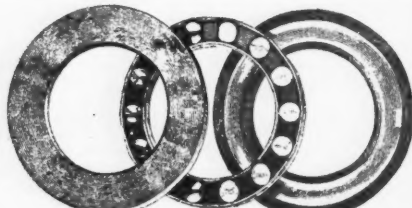
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WANTED—POSITION, SUPERINTENDENT preferred, with first-class firm by reliable automobile expert, who has had extensive experience in auto manufacturing in all its branches, and held positions as superintendent, buyer and designer; at present with Canadian firm, but am desirous of making a change. Address Box 239, care of Motor Age.

YOUNG MAN, THOROUGHLY AMERICAN, desires place in a modern garage where he will have opportunity to work with competent mechanic and thoroughly learn the business and trade. Has had some garage experience. Willing to start in for very reasonable amount of pay. Good habits. Can furnish the best of references as to character. Do not use intoxicants. Address Box E. 241, care of Motor Age.

Garages, Shops, Etc., FOR SALE

A BUSINESS OPPORTUNITY—A COMPLETE auto tire repair plant for sale. The largest and most up-to-date plant in this section. For further information write Box E-235, care of Motor Age.

BEST BUSINESS OPENING IN ENTIRE Northwest for immediate investment. Absolutely satisfactory reasons for selling given. Investment of from about ten thousand to fifteen thousand maximum will amply finance proposition. Ten thousand dollars conservative estimate net profits in next ten months. North Dakota will be best field in United States for automobile sales next season account war prices for all grains and stock. Business thoroughly established. Splendid little city of six thousand with white way, clean and up to date. Post office building cost one hundred fifty thousand. Capital of lake region. Large territory on Cadillac available. Also agency still open for two best selling cheap cars on American market. Established supply business pays all expenses. Rare and exceptional opportunity for energetic young man with reasonable backing. Part of financing can probably be arranged locally. Reply promptly to "Lake Region," c/o Motor Age.

FOR SALE AT A BARGAIN—GARAGE with full equipment, including Bowser pump machinery, oil tanks, vulcanizer, Prest-O and Searchlight service. Located on Lincoln Highway where hundreds of tourists pass every day. Building can be leased for 5 years. Average gas sales 1,500 gal. per week. A bargain at \$2,500. Address Box E 170, c/o Motor Age.

FOR SALE AT INVOICE PRICE—GARAGE that has been running for the last six (6) years. Agency for the best line of cars on the market. Repair shop that keeps from three to six men busy at all times. Located in the heart of the Southern Minnesota farming district. Best of reasons for selling. Address Box E 243, care Motor Age.

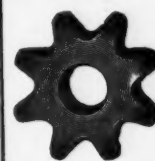
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FOR SALE—VULCANIZING PLANT IN SO. California town, doing good business. Finest climate on earth. Ideal for health seeker. Address for particulars, A. H. May, 1318 Fifth St., San Diego, Cal.

Chicago Shock Absorbers for Ford Cars

Made of special steel. Simple and easy to apply. No holes to drill, no parts to remove but the shackles. Anyone can apply in 30 minutes. Made for either Touring Car or Runabout. When ordering state which. Special price to dealers. List price, complete set.....\$8.00

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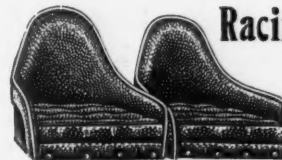
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Ford Owners Gain from two to three miles on every gallon of gasoline by the use of the

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Satisfaction guaranteed or you may return at our expense and receive your money back. Price \$3.00.

C. F. ROPER & CO., Box M. A., Hopedale, Mass.



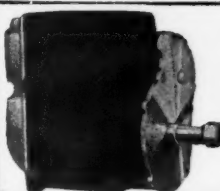
Racing Type ROADSTER SEATS

Adapted for any car; will make an old car up to date. Made of heavy gauge leaded steel, rolled edges, durable and comfortable, 16" wide, 17" deep, 21" high. Upholstered in black muleskin, pair...\$23 Upholstered in leather, pair.....25 DEPT. O.

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FOR FORD CARS FISHER ELECTRIC LIGHTING and STARTING SYSTEM

Motor and generator combined in one compact, self-contained unit, although acting independent of one another. 12-volt, 3-wire system, 6-volt lamps. Noiseless. Attached without machine work. Write

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Makers of

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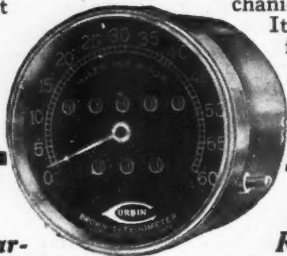
New Hampshire

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"The Speedometer of Absolute Accuracy"

Accurate Under All Conditions

As a result of its centrifugal principle, the Corbin-Brown remains absolutely accurate in all temperatures, at all altitudes, and in the presence of electrical equipment.



Friction-Reducing, Jar-Absorbing Shafting

The continual shocks and vibrations of the road are readily absorbed by the Corbin-Brown's flexible shafting. It is the strongest, most durable shafting made—an exclusive feature of the Corbin-Brown Speedometer.

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Owing to its centrifugal principle, the Corbin-Brown is subject to an extremely simple mechanical treatment.

Its parts are few, large and strong — built to withstand the wear and strain of constant, rigorous service

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An absolutely steady hand, a stationary, widely spaced scale of miles, and large, white numerals on a black background, make the reading of the Corbin-Brown's record easy and accurate, no matter what the road conditions.

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THE AMERICAN HARDWARE CORPORATION, Successors
NEW BRITAIN, CONN.

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1-ton chassis 1350.00
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No Better Units Built

We ask the opportunity to prove our statements.
Wire or write for catalog and complete information.

Republic Motor Truck Co., Alma, Mich.
(FORMERLY ALMA MOTOR TRUCK CO.)

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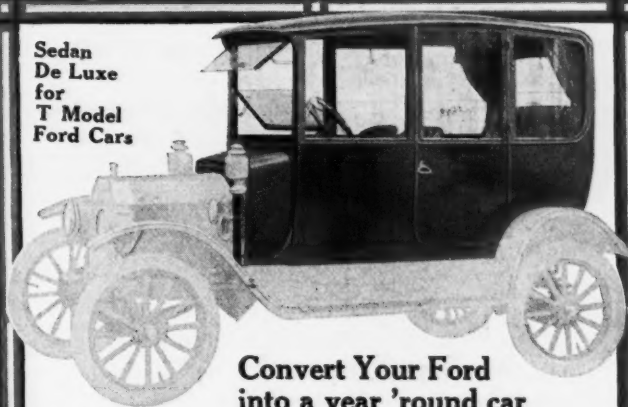
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**Convert Your Ford
into a year 'round car**

Be prepared for the cold, rainy or wintry days ahead by making your Ford a ROBBINSFord. This design is by far the most handsomely appointed closed car in the special body field. It seats five passengers without crowding; has luxuriously upholstered seats; electric dome lights; floors richly carpeted and is in every respect a worthy member of the popular

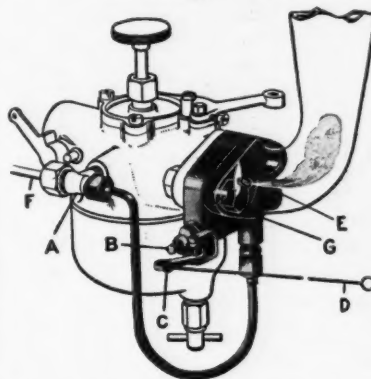
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of Standardized Bodies for Ford Cars

You can now take your Ford to a Local Dealer—and in a few hours' time he will return it—completely transformed into a ROBBINSFord. Tell us what style body you prefer—a Coupe, Sedan or Commercial body—and we'll send the name of nearest dealer. Write TODAY giving the name of the man or firm you usually do business with and we'll send you descriptive literature and prices by return mail.

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Quickly in Cold Weather
Only \$2.50



One pull on ring "D" on steering post, dash-board or radiator shoots a powerful spray of gasoline vapor direct from feed pipe into manifold. Makes your motor start quickly under full power. Saves the back-breaking job of spinning your starting crank on cold days. Saves wear and tear on self-starter and storage battery.

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General Sales Agents for the Shimpf Starter Co., Boston



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American Made for American Trade



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CABLE ADDRESS
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CODE 'E'
BY EDITOR: BRAC
WESTERN: JON

Bristol November 19, 1914.

To the Automobile Industry.

Gentlemen:

Is your house in order ?

This very pertinent question is being asked daily.

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We claim to be the one big American manufactory which has the men, the machinery, and experience sufficiently large to take care of this country's ball bearing quantity and quality requirements.

We invite you to inspect our plant, either in person or by going with us through important departments pictured in a brochure we have issued and which will be forwarded to you on request.

In so doing, we answer this all-important question.

Our house is in order.

Please look us over.

Yours very truly,

THE NEW DEPARTURE MANUFACTURING COMPANY,

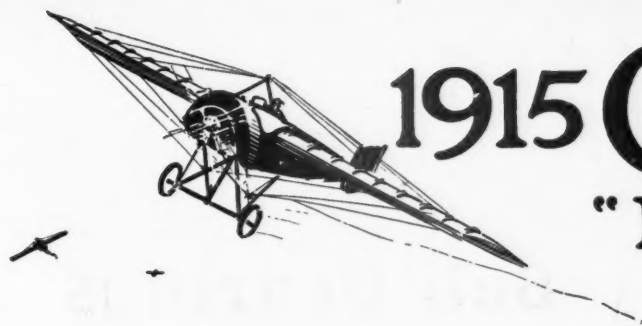
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DWF/DB

The New Departure Manufacturing Co.

BRISTOL, CONN., U. S. A.

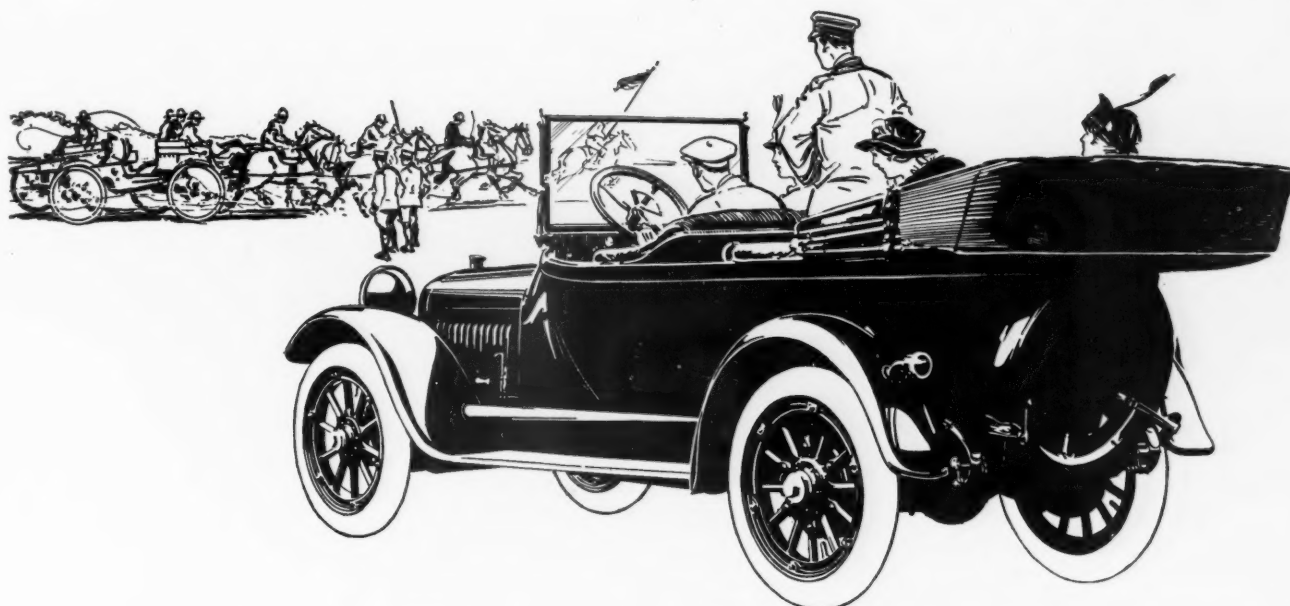
Western Branch: 1016-17 Ford Bldg., Detroit, Mich.



1915 Chalmers

"Light Six"

\$1650



Our Fastest Selling Car

Over 40,000 people now drive Chalmers cars.

But the Chalmers 1915 "Light Six" is the fastest selling car we ever built.

First announced last May, over 3500 "Light Sixes" were delivered in three months.

In this time the motor-wise of the country tested this wonderful car in nearly 3,000,000 miles of service.

As a result of these tests in the hands of owners, the demand for "Light Sixes" is far exceeding our anticipations.

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At \$1650 the Chalmers "Light Six" is setting new sales records. It is the fastest selling car at its price on the market.

At this writing, sales records show that ***we have delivered more cars in the last three months than in the same three months of 1913.*** And this in spite of the fact that 1913 was the biggest year in the automobile industry.

There are many reasons for this tremendous sale of

the Chalmers "Light Six." Here are just a few of them:

A ***different*** kind of automobile beauty; unusually handsome finish; Pullman-like comfort; a 48 H. P. long stroke non-stallable motor which "stays put"; graceful molded oval fenders of both strength and beauty; ***4½-inch tires—"Nobby" tread on rear wheels;*** unusually complete equipment, including Chalmers-made one-man top of silk mohair; quick acting storm curtains; five demountable rims; one motion Chalmers-Entz electric starter; Klaxon horn; electric lights, etc. And perhaps the greatest reason of all, the unusually high quality in a car at such a price.

Get Full Value in Your Motor Car Investment—Write for Book

There are many other reasons why the 1915 "Light Six" is the fastest selling of all Chalmers models. These additional reasons are given in a special issue of Chalmers "Doings" which has just come from the press. This latest Chalmers book has a full color cover and pictures of both the "Light Six" and our larger "Master Six." It is filled with facts and information which will enable you to compare the Chalmers with all other cars. It contains complete description and photographs of all models, including the Limousine, Sedan and Coupelet.

Dealers—Send for this latest issue of "Chalmers Doings"—compare the car you are selling with the 1915 Chalmers. If the car you handle doesn't come up to Chalmers qualifications and Chalmers sales record, write to the Chalmers Company for dealer proposition

Chalmers Motor Company, Detroit

The Climax of Six Cylinder Efficiency

Seven-passenger touring car
125-inch wheelbase
Electrically started
Electrically lighted
Full stream-line body design
Color—Royal blue, ivory white striping
Bright French finish, long grain, black, hand-buffed leather
One man top
Pockets in all doors

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Extra long underslung rear springs
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Center control
45 horsepower motor
High tension magneto
Demountable rims

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Electric control buttons on steering column



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